



Regional Growing Smarter Implementation Project

Final Report

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**Maricopa Association of Governments
Regional Development Division
302 N. 1st Avenue, Ste 300
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TABLE OF CONTENTS

CHAPTER	PAGE
EXECUTIVE SUMMARY	1
INTRODUCTION	4
REGIONAL TECHNICAL REPORTS	4
BEST PRACTICES PAPERS	5
PLANNERS STAKEHOLDERS GROUP	5
ORGANIZATION OF FINAL REPORT	6
PART 1 GROWTH AND DEVELOPMENT	8
1.0 DEMOGRAPHIC CHANGE	8
TOTAL POPULATION	8
AGE COMPOSITION	9
MIGRATION	11
IMMIGRATION AND NATURALIZATION SERVICE DATA	12
STUDY MIGRATION ESTIMATES	13
POPULATION CHANGE BY COMPONENT	14
2.0 ECONOMIC CHANGE	16
2.1 ECONOMIC EFFECTS OF SHEER GROWTH	16
2.2 LOW WAGE ECONOMY	17
2.3 GREATER PHOENIX INDUSTRY CLUSTERS	17
2.4 ECONOMIC CHANGE DURING THE 1990'S	18
2.5 REGIONAL ECONOMIC DEVELOPMENT STRATEGY	19
2.6 SUB-REGIONAL ECONOMICS	20
2.7 REGIONAL STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS	21
2.7.1 LONG TERM CHANGE	21
2.7.2 REGIONAL OPPORTUNITIES AND THREATS	23
2.7.3 REGIONAL BUSINESS CLIMATE STRENGTHS AND WEAKNESSES	25
2.8 SUB-REGIONAL STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS	28
2.9 ECONOMIC DEVELOPMENT STRATEGIES	31
3.0 JOB CENTERS	35
JOB CENTERS BY STAGE DEVELOPMENT	35
REGIONAL JOB CENTERS	36
INDUSTRY CLUSTER MIX OF JOB CENTERS	39
4.0 PROJECTED GROWTH & DEVELOPMENT	42
4.1 GREATER PHOENIX	42
4.1.1 ECONOMY	44
4.1.2 POPULATION	49
4.2 MAG REGION PROJECTIONS	54
CENSUS DATA	54
EMPLOYMENT DATABASE	54
EXISTING LAND USE	54
FUTURE LAND USE	55
LARGE SCALE DEVELOPMENT	55
MARICOPA COUNTY INTERIM SOCIOECONOMIC PROJECTIONS	63
EMPLOYMENT	72
JOB HOUSING BALANCE AND URBAN CONCENTRATION	80

TABLE OF CONTENTS

CHAPTER		PAGE
	PART II INFRASTRUCTURE	91
5.0	REGIONAL TRANSPORTATION	91
5.1	OVERVIEW OF METROPOLITAN TRANSPORTATION PLANNING	91
	REGIONAL TRANSPORTATION PLAN	92
	LONG RANGE TRANSPORTATION PLAN	92
	TRANSPORTATION IMPROVEMENT PROGRAM	92
	REGIONAL AVIATION	92
5.2	EXISTING & PLANNED SURFACE TRANSPORTATION SYSTEM	93
	HIGHWAY SYSTEM	93
	FREEWAYS/EXPRESSWAYS	93
	ARTERIALS	94
	MASS TRANSIT SYSTEM	94
	REGIONAL PUBLIC TRANSIT AUTHORITY	94
	LOCAL TRANSIT	96
	REGIONAL TRANSIT SYSTEM AND HIGH CAPACITY TRANSIT	96
	TRANSIT IN LOCAL GENERAL PLANS	96
	ADDITIONAL TRANSIT SERVICES	96
	BICYCLE AND TRAILS	96
	REGIONAL BICYCLE PLAN MAPS	96
	REGIONAL OFF-STREET SYSTEM PLAN (ROSS)	97
	MARICOPA COUNTY REGIONAL TRAIL SYSTEM	97
	PEDESTRIAN FACILITIES	102
	REGIONAL PEDESTRIAN PLANNING	102
	FUTURE SOURCES WITHOUT SALES TAX EXTENSION	103
5.3	PROJECTED SURFACE TRANSPORTATION SITUATION	104
	REGIONAL GROWTH	104
	PROJECTED TRAVEL DEMAND	104
5.4	REGIONAL TRANSPORTATION PLAN	110
	REGIONAL TRANSPORTATION PLANNING PROCESS	110
	PUBLIC INVOLVEMENT	110
	GOALS, OBJECTIVES AND PERFORMANCE MEASURES	110
	BACKGROUND STUDIES	111
	MODELING SCENARIOS AND HYBRID DRAFT PLAN	113
	HYBRID PLAN	113
	FINAL DRAFT PLAN	114
	REGIONAL REVENUE SOURCES INCLUDING SALES TAX EXTENSION	114
	REGIONAL TRANSPORTATION PLAN COMPONENTS	114
	FREEWAYS/HIGHWAYS	115
	ARTERIALS	115
	BUS SERVICE	115
	LIGHT RAIL	117
	COMMUTER RAIL	117
	OTHER TRANSIT SERVICES	118
	BICYCLE PEDESTRIAN TRAILS	118
	ANALYSIS OF FINAL DRAFT PLAN	118
	PERFORMANCE MEASURE ASSESSMENT	118
	TITLE VI AND ENVIRONMENTAL JUSTICE	124

TABLE OF CONTENTS

CHAPTER		PAGE
	RTP PHASING PRIORITIES.....	125
	PLAN PHASING FACTORS.....	125
5.5	MOTOR FREIGHT.....	131
	REGIONAL FREIGHT INFRASTRUCTURE.....	131
	FREIGHT IN THE MAG REGION.....	131
	TRUCKING.....	131
	RAIL.....	132
	AIR CARGO.....	132
5.6	NEXT STEPS IN THE REGIONAL FREIGHT PLANNING PROCESS.....	134
	AVIATION.....	134
	EXISTING REGIONAL AVIATION SYSTEM.....	135
	PROJECTED AVIATION DEMAND – 2025.....	135
	DEMAND CAPACITY OF EXISTING REGIONAL AVIATION SYSTEM.....	135
	ALTERNATIVES TO ADDRESS DEFICIENCIES.....	137
6.0	REGIONAL WASTEWATER TREATMENT.....	139
6.1	PROJECTED WASTEWATER CAPACITY.....	139
6.2	PROJECTED WASTEWATER GENERATION.....	114
6.3	REGIONAL NET CAPACITY.....	145
6.4	LOCAL NET CAPACITY.....	145
	CONCLUSIONS.....	148
7.0	REGIONAL SOLID WASTE MANAGEMENT.....	150
	LANDFILLS.....	150
	PROJECTED WASTE GENERATION.....	151
	RECYCLING.....	151
	PROJECTED NET LANDFILL CAPACITY.....	154
	CONCLUSIONS.....	156
8.0	REGIONAL OPEN SPACE.....	157
8.1	REGIONAL OPEN SPACE PLANS.....	157
	OVERVIEW.....	157
	MANAGEMENT APPROACHES.....	158
	CONSERVATION.....	158
	RETENTION.....	158
	SECURED OPEN SPACE.....	158
8.2	REGIONAL CONNECTIVITY.....	158
	REGIONAL OFF-STREET SYSTEM (ROSS).....	158
	MARICOPA COUNTY REGIONAL TRAIL SYSTEM.....	160
8.3	AGENCY ROLES.....	160
	FEDERAL LAND OWNERSHIP AND MANAGEMENT.....	160
	BUREAU OF LAND MANAGEMENT.....	160
	STATE AGENCIES.....	161
	ARIZONA STATE LAND DEPARTMENT.....	161
	STATE PARKS DEPARTMENT.....	161
	MARICOPA COUNTY FLOOD CONTROL DISTRICT.....	162
	LAND TRUSTS AND NON-PROFITS.....	162
8.4	LOCAL ROLE IN REGIONAL OPEN SPACE PLANNING.....	162
	SUMMARY OF LOCAL PLANNING FOR REGIONAL OPEN SPACE.....	162
8.5	EXISTING REGIONAL OPEN SPACE.....	165
8.6	REGIONAL OPEN SPACE ASSESSMENT.....	168

TABLE OF CONTENTS

CHAPTER	PAGE
CONCLUSIONS.....	170
9.0 SCHOOL FACILITIES.....	172
9.1 CAPITAL FUNDING.....	175
9.2 OPERATIONS FUNDING.....	177
9.3 SCHOOL PROJECTIONS.....	178
CURRENT ENROLLMENT.....	178
PROJECTED ENROLLMENT.....	180
FACILITY SPACE AND COST PROJECTIONS.....	186
PART III FISCAL.....	192
10.0 FISCAL BALANCE.....	192
10.1 GENERAL CONCLUSIONS.....	192
10.2 LOCAL REVENUE SOURCES.....	192
10.3 LOCAL TAXES.....	193
10.4 LOCAL AND NON-LOCAL REVENUES.....	194
10.5 MODELING FISCAL IMPACTS.....	196
10.6 FISCAL BALANCE.....	196
11.0 SALES TAX GENERATION.....	199
NET SURPLUS/LEAKAGE RESULTS AT BUILD-OUT.....	200
PART IV BEST PLANNING PRACTICES.....	203
12.0 ADEQUATE PUBLIC FACILITIES ORDINANCES.....	204
12.1 INTENT OF APFO'S.....	204
12.2 CONSTITUTIONAL ISSUES.....	204
12.3 IMPLEMENTATION.....	205
12.4 LOCAL EXAMPLES.....	205
12.5 FINDINGS.....	206
12.6 RECOMMENDATIONS.....	207
13.0 AFFORDABLE HOUSING.....	209
13.1 THE AFFORDABLE HOUSING PROBLEM IN METRO PHOENIX.....	209
13.2 LOCAL AFFORDABLE HOUSING POLICY.....	211
GENERAL PLAN TOOLS.....	211
FISCAL TOOLS.....	211
HOUSING TRUST FUNDS.....	211
DEVELOPMENT FEE EXEMPTIONS.....	211
LINAGE FEES.....	212
ADEQUATE PUBLIC FACILITIES ORDINANCES (APFO'S).....	212
TAX INCREMENT FINANCING (TIF).....	213
ZONING AND SUBDIVISION TOOLS.....	213
13.3 RECOMMENDATIONS.....	213
14.0 DEVELOPMENT IMPACT FEES.....	216
14.1 AUTHORITY FOR DEVELOPMENT IMPACT FEES.....	216
ARIZONA STATUTES.....	261
CITIES AND TOWNS.....	216
14.2 COMPARATIVE IMPACT FEES.....	217
IMPACT FEES IN METRO PHOENIX.....	217
SINGLE FAMILY DEVELOPMENT IMPACT FEES IN MARICOPA COUNTY MUNICIPALITIES.....	218
MULTIFAMILY DEVELOPMENT IMPACT FEES IN MARICOPA COUNTY MUNICIPALITIES.....	219

TABLE OF CONTENTS

CHAPTER		PAGE
	RETAIL DEVELOPMENT IMPACT FEES IN MARICOPA COUNTY MUNICIPALITIES.....	220
	OFFICE DEVELOPMENT IMPACT FEES IN MARICOPA COUNTY MUNICIPALITIES.....	221
	INDUSTRIAL DEVELOPMENT IMPACT FEES IN MARICOPA COUNTY MUNICIPALITIES.....	222
	METRO PHOENIX IMPACT FEES COMPARED TO OTHER REGIONS.....	223
14.3	REGIONAL DEVELOPMENT IMPACT FEES.....	224
14.4	JOINT IMPACT FEES FOR LOCALLY PROVIDED INFRASTRUCTURE.....	224
14.5	MARKET EFFECT OF IMPACT FEES AND ALTERNATIVES FOR INFRASTRUCTURE FINANCING.....	225
	ECONOMIC IMPACT OF DEVELOPMENT IMPACT FEES.....	225
	PRICE EFFECT OF IMPACT FEES.....	228
	COMMUNITY FACILITIES DISTRICTS.....	229
14.6	CONCLUSIONS.....	230
14.7	RECOMMENDATIONS.....	232
15.0	INTERGOVERNMENTAL PLANNING.....	234
	ISSUES.....	234
	INTERGOVERNMENTAL PLANNING SUCCESSES.....	236
	CITY/COUNTY INFRASTRUCTURE PLANNING.....	236
	COST AND/OR BENEFIT SHARING AGREEMENTS.....	237
	PLANNING FOR SCHOOLS.....	238
	ECONOMIES OF SCALE IN THE DEVELOPMENT APPROVAL PROCESS.....	239
	CONCLUSIONS.....	239
16.0	INFILL DEVELOPMENT.....	240
	BACKGROUND.....	240
	LOCAL GOVERNMENT PROCESSES TO PROMOTE INFILL.....	241
	CITY OF AUSTIN SMART GROWTH AND DEVELOPMENT MATRIX.....	242
	CITY OF TEMPE CODE AUDIT AND REVISION.....	242
	TECHNIQUES FOR FACILITATING COLLABORATION FOR INFILL.....	246
	IMPLEMENT A PARCEL ASSEMBLY PROGRAM AND STRATEGIC LAND BANKING.....	247
	DEMONSTRATION PROJECTS AND PUBLIC EDUCATION.....	247
	TEMPORARY PROPERTY TAX EXEMPTIONS FOR MULTIFAMILY HOUSING.....	247
	ADOPT TAX POLICIES WHICH DISCOURAGE HOLDING UNIMPROVED PROPERTY.....	247
	FINDINGS.....	248
	RECOMMENDATIONS.....	248
17.0	TRANSIT ORIENTED DEVELOPMENT.....	250
	TRANSIT ORIENTED DEVELOPMENT DEFINED.....	250
	RELEVANCE OF TOD TO MAG REGION.....	251
	BENEFITS AND COSTS.....	251
	URBAN DESIGN ELEMENTS.....	253

TABLE OF CONTENTS

CHAPTER	PAGE
INTEGRATE TRANSIT AND LAND USE PLANNING: MIXTURE OF LAND USES	253
DOES THE MAG REGION HAVE SUFFICIENT DENSITY TO SUPPORT TRANSIT?	255
PEDESTRIAN AND BICYCLING FACILITIES	255
PARKING	257
PROMINENT PUBLIC SPACES	257
SUCCESSFUL EXAMPLES	257
IMPLEMENTATION	259
CHALLENGES TO CREATING TRANSIT ORIENTED DEVELOPMENT	259
OVERCOMING THE IMPLEMENTATION BARRIERS	260
RESOURCES FOR MAG MEMBER AGENCIES	261
MAG PEDESTRIAN AREA POLICIES AND DESIGN GUIDELINES	261
VALLEY METRO PEDESTRIAN-ORIENTED DESIGN (PED) STANDARDS AND DESIGN GUIDELINES	261
LIGHT RAIL TRANSIT; PHOENIX, ARIZONA – ECONOMIC DEVELOPMENT ALONG THE PLANNED LIGHT-RAIL LINE	262
CITY OF PHOENIX TRANSIT OVERLAY DISTRICT	262
PART V REGIONAL EVALUTION	263
18.0 EVALUATION PLAN	263
PERFORMANCE MEASURES	263
1 GROWTH	264
2 URBAN FORM	264
3 QUALITY ECONOMY	265
4 TRANSPORTATION AND OTHER REGIONAL INFRASTRUCTURE	265
5 HOUSING	266
6 ENVIRONMENT	266
7 SOCIAL WELL-BEING	266

LIST OF FIGURES

FIGURES	PAGE
1-1 TOTAL POPULATION MARICOPA COUNTY	8
1-2 TOTAL POPULATION AND GROWTH RATE MARICOPA COUNTY	9
1-3 POPULATION BY AGE COHORT MARICOPA COUNTY	9
1-4 POPULATION BY RACE AND HISPANIC ORIGIN MARICOPA COUNTY	10
1-5 POPULATION COMPOSITION BY RACE AND HISPANIC ORIGIN MARICOPA COUNTY, 1980, 2000	10
1-6 RACE AS PERCENTAGE OF TOTAL MARICOPA COUNTY	11
1-7 TOP 15 STATES OF ORIGIN AND DESTINATION MIGRATION TO AND FROM MARICOPA COUNTY, 1984-1999	12
1-8 TOP 15 METROPOLITAN AREAS OF ORIGIN AND DESTINATION MIGRATION TO AND FROM MARICOPA COUNTY, 1984-1999	12
1-9 ESTIMATED ILLEGAL IMMIGRANT POPULATION ARIZONA AND UNITED STATES	13
1-10 HISPANIC SHARE OF TOTAL POPULATION MARICOPA COUNTY	14
1-11 HISPANIC SHARE OF TOTAL POPULATION MARICOPA COUNTY	14
1-12 COMPONENTS OF POPULATION CHANGE MARICOPA COUNTY, 1981 – 2000	15
2-1 POPULATION & JOB GROWTH MARICOPA COUNTY, 1970 –2002	16
2-2 NUMBER OF EMPLOYED PERSONS BY ANNUAL SALARY RANGE METRO PHOENIX 2000	17
2-3 INDUSTRY CLUSTER BY WAGE CATEGORY MARICOPA COUNTY, 2000	18
2-4 LOCATION QUOTIENTS, SELECTED INDUSTRY CLUSTERS MARICOPA COUNTY, 1969-2000	19
2-5 CONCENTRATION OF TARGET INDUSTRY CLUSTERS IN MAG MEMBER AGENCIES, 2000	20
2-6 CONCENTRATION OF “OTHER BASIC” INDUSTRY CLUSTERS IN MAG MEMBER AGENCIES, 2000	21
2-7 AVERAGE INDUSTRY COMPATIBILITY BY JOB CENTER	29
2-8 STRATEGY EMPHASIS BY COMMUNITY	33
3-1 JOB CENTERS DEVELOPMENT STAGES	35
3-2 EXISTING REGIONAL JOB CENTERS	38
3-3 FUTURE REGIONAL JOB CENTERS	39
4-1 PLANNED DEVELOPMENT IN GREATER PHOENIX REGION	43

LIST OF FIGURES

FIGURES	PAGE
4-2 REAL GROSS REGIONAL PRODUCTS & TOTAL JOBS.....	46
4-3 TOTAL POPULATION GREATER PHOENIX (1980 –2030)	50
4-4 EMPLOYERS IN GREATER PHOENIX.....	51
4-5 COMPONENTS OF POPULATION CHANGE (1000 PERSONS)	52
4-6 POPULATION BY ETHNIC AND RACIAL GROUPS (1000 PERSONS).....	53
4-7 POPULATION DENSITY (YEAR 2000 CENSUS) MARICOPA COUNTY, ARIZONA.....	56
4-8 VACANCY RATES (YEAR 2000 CENSUS) MARICOPA COUNTY, ARIZONA.....	57
4-9 PERSONS PER OCCUPIED UNIT (YEAR 2000 CENSUS) MARICOPA COUNTY, ARIZONA.....	58
4-10 EMPLOYMENT LOCATIONS (2001)	59
4-11 EXISTING LAND USE (2000)	60
4-12 FUTURE LAND USE MARICOPA COUNTY, ARIZONA	61
4-13 LARGE SCALE DEVELOPMENTS.....	62
4-14 2000 POPULATION CONCENTRATION FOR INTERIM SOCIOECONOMIC PROJECTIONS	68
4-15 2010 POPULATION CONCENTRATION FOR INTERIM SOCIOECONOMIC PROJECTIONS	69
4-16 2020 POPULATION CONCENTRATION FOR INTERIM SOCIOECONOMIC PROJECTIONS	70
4-17 2030 POPULATION CONCENTRATION FOR INTERIM SOCIOECONOMIC PROJECTIONS	71
4-18 2000 EMPLOYMENT CONCENTRATION FOR INTERIM SOCIOECONOMIC PROJECTIONS	76
4-19 2010 EMPLOYMENT CONCENTRATION FOR INTERIM SOCIOECONOMIC PROJECTIONS	77
4-20 2020 EMPLOYMENT CONCENTRATION FOR INTERIM SOCIOECONOMIC PROJECTIONS	78
4-21 2030 EMPLOYMENT CONCENTRATION FOR INTERIM SOCIOECONOMIC PROJECTIONS	79
4-22 2000 JOB HOUSING BALANCE FOR INTERIM SOCIOECONOMIC PROJECTIONS	83
4-23 2010 JOB HOUSING BALANCE FOR INTERIM SOCIOECONOMIC PROJECTIONS	84
4-24 2020 JOB HOUSING BALANCE FOR INTERIM SOCIOECONOMIC PROJECTIONS	85
4-25 2030 JOB HOUSING BALANCE FOR INTERIM SOCIOECONOMIC PROJECTIONS	86
4-26 2000 URBAN CONCENTRATION FOR INTERIM SOCIOECONOMIC PROJECTIONS	87

LIST OF FIGURES

FIGURES	PAGE
4-27 2010 URBAN CONCENTRATION FOR INTERIM SOCIOECONOMIC PROJECTIONS	88
4-28 2020 URBAN CONCENTRATION FOR INTERIM SOCIOECONOMIC PROJECTIONS	89
4-29 2030 URBAN CONCENTRATION FOR INTERIM SOCIOECONOMIC PROJECTIONS	90
5-1 REGIONAL ROADWAY NETWORK.....	95
5-2 EXPRESS BUS AND RAPID TRANSIT PLAN	98
5-3 LIGHT RAIL SERVICE.....	99
5-4 REGIONAL ON-ROAD BIKE LANES.....	100
5-5 REGIONAL OFF-STREET SYSTEM PLAN POTENTIAL CORRIDORS	101
5-6 PERCENT GROWTH OF POPULATION, VMT AND CAPACITY MILES	105
5-7 2000 PM PEAK HOUR LEVELS OF SERVICE	106
5-8 2030 PM PEAK HOUR FREEWAY LEVELS OF SERVICE	107
5-9 2000 PM PEAK HOUR INTERSECTION LEVELS OF SERVICE	108
5-10 2030 PM PEAK HOUR INTERSECTION LEVELS OF SERVICE	109
5-11 COMBINED RESULTS OF PUBLIC EVENTS.....	112
5-12 MAJOR REGIONAL REVENUE SOURCES (2006-2025)	116
5-12B MAG REGIONAL TRANSPORTATION PLAN ROADWAY SYSTEM IMPROVEMENTS FREEWAYS/HIGHWAYS	119
5-13 MAG REGIONAL TRANSPORTATION PLAN ROADWAY SYSTEM IMPROVEMENTS FREEWAYS/HIGHWAYS ARTERIALS	120
5-14 SUPER GRID SYSTEM: NEW, ENHANCED, EXISTING AND RURAL SERVICE	121
5-15 FREEWAY AND ARTERIAL BRT ROUTES.....	122
5-16 IDENTIFIED HIGH CAPACITY CORRIDORS	123
5-17 MAG REGIONAL TRANSPORTATION PLAN PLAN PHASING FREEWAYS/HIGHWAYS.....	126
5-18 MAG REGIONAL TRANSPORTATION PLAN PLAN PHASING FREEWAYS/HIGHWAYS ARTERIALS.....	127
5-19 PROPOSED SUPER GRID AND RURAL SERVICE DRAFT PLAN PHASING, SEPTEMBER 9, 2003	128
5-20 PROPOSED FREEWAY AND ARTERIAL BRT ROUTES DRAFT PLAN PHASING, SEPTEMBER 9, 2003	129
5-21 IDENTIFIED HIGH CAPACITY CORRIDORS DRAFT PLAN PHASING, SEPTEMBER 9, 2003	130
5-22 TOTAL FREIGHT FLOWS INTO, OUT OF, AND WITHIN THE MAG REGION BY MODE	132
5-23 REGIONAL FREIGHT INFRASTRUCTURE	133
5-24 REGIONAL AVIATION FACILITIES.....	136
6-1 EXISTING AND FUTURE PUMP STATION, REUSE/RECHARGE, AND TREATMENT PLANT LOCATIONS IN MARICOPA COUNTY	140
6-2 REGIONAL PROJECTED WASTEWATER CAPACITY AND GENERATION TOTALS.....	145

LIST OF FIGURES

FIGURES	PAGE
7-1 TRANSFER STATION, MRF, AND LANDFILL LOCATIONS IN MARICOPA COUNTY	152
8-1 MAG DESERT SPACES PLAN MANAGEMENT APPROACHES.....	159
8-2 REGIONAL OPEN SPACES.....	167
8-3 PLANNED AND SECURED OPEN SPACE AND CONSERVATION AREA	169
9-1 SCHOLL DISTRICT BOUNDARIES MARICOPA COUNTY	173
9-2 ELEMENTARY/UNION SCHOOL BOUNDARIES MARICOPA COUNTY.....	174
10-1 SHARE IF INTERGOVERNMENTAL REVENUES.....	195
14-1 CONCEPTUAL FRAMEWORK FOR ECONOMIC IMPACT ANALYSIS OF IMPACT FEES.....	226
14-2 WHO PAYS FOR IMPACT FEES? PARTICIPANTS IN THE DEVELOPMENT PROCESS	227
15-1 METRO PHOENIX AVERAGE FISCAL IMPACT PER ACRE	235
16-1 AUSTIN, TEXAS SMART GROWTH CRITERIA MATRIX.....	243

LIST OF TABLES

TABLES	PAGE
2-1 POPULATION GROWTH (MILLIONS)	21
2-3 CITIES WITH TOP-RANKING JOB CENTERS	30
2-4 STRATEGY CATEGORIES & SUPPORTING POLICIES MENTIONED IN COMMUNITY GENERAL PLANS OF ECONOMIC DEVELOPMENT STRATEGIES AND PLANS	34
3-1 TOTAL JOBS	35
4-1 GROSS REGIONAL PRODUCT BY DEMAND COMPONENTS GREATER PHOENIX REGION, 2000-2035	44
4-2 GROSS PRODUCT BY DEMAND COMPONENT GREATER PHOENIX AND UNITED STATES, 2000, 2015 AND 2030	45
4-3 SOURCES FOR MEETING LOCAL DEMAND GREATER PHOENIX, 1980-2035	45
4-4 OUTPUT BY INDUSTRY CLUSTER GREATER PHOENIX, 2000, 2015 & 2030	47
4-5 JOBS BY INDUSTRY CLUSTER GREATER PHOENIX, 2000, 2015 & 2030	48
4-6 TOTAL PERSONAL INCOME BY COMPONENT GREATER PHOENIX, 2000, 2015 & 2030	49
4-7 POPULATION BY AGE GROUP GREATER PHOENIX (2000-2030)	51
4-8 TOTAL RESIDENT POPULATION BY MUNICIPAL PLANNING AREA (MPA), MARICOPA COUNTY	65
4-9 POPULATION RANK ORDER BY MUNICIPAL PLANNING AREA(MPA) MARICOPA COUNTY (2000-2030)	66
4-10 POPULATION CHANGE BY MUNICIPAL PLANNING AREA (MPA)	67
4-11 TOTAL EMPLOYMENT BY MUNICIPAL PLANNING AREA (MPA)	74
4-12 EMPLOYMENT CHANGE BY MUNICIPAL PLANNING AREA (MPA)	75
4-13 JOBS HOUSING BALANCE BY MUNICIPAL PLANNING AREA (MPA)	81
4-14 JOB HOUSING BALANCE RANK ORDER BY MUNICIPAL PLANNING AREA (MPA)	82
5-1 CENTERLINE MILES FOR NEW FREEWAYS	94
5-2 DRAFT HYBRID FUNDING BY MODE	117
5-3 BASE YEAR AND FORECAST OF AVIATION ACTIVITY IN THE MAG REGION	135
5-4 COMPARISON OF SERVICE CAPACITY TO FORECASTED TRAFFIC	137
6-1 CURRENT AND PROJECTED WASTEWATER TREATMENT CAPACITY	141
6-2 PROJECTED WASTEWATER GENERATION BY MPA MILLIONS OF GALLONS PER DAY	144
6-3 PROJECTED NET CAPACITY BY MPA MILLIONS OF GALLONS PER DAY	146
7-1 MARICOPA COUNTY LANDFILL INVENTORY	150

LIST OF TABLES

TABLES	PAGE
7-2 PROJECTED GROSS RESIDENTIAL AND COMMERCIAL WASTE GENERATION TONS PER YEAR	153
7-3 AMOUNT OF WASTE DIVERTED TO MATERIAL RECOVERY FACILITIES TONS PER DAY	154
7-4 PROJECTED REMAINING LANDFILL CAPACITY	155
8-1 GRANT AWARDS FOR REGIONALLY SIGNIFICANT OPEN SPACE PROJECTS.....	161
8-2 NON-PROFIT AGENCY REGIONAL OPEN SPACE PROTECTION EFFORTS.....	162
8-3 STATUS OF LOCAL OPEN SPACE PLANNING	164
8-4 REGIONAL OPEN SPACES.....	165
8-5 WILDERNESS AREAS AND OTHER EXISTING REGION SERVING PRESERVES	166
8-6 REGIONAL OPEN SPACE ASSESSMENT.....	168
9-1 PUBLIC SCHOOL ENROLLMENT BY GRADE MARICOPA COUNTY.....	175
9-2 CAPITAL FACILITIES FUNDING STANDARDS STATE OF ARIZONA.....	176
9-3 PERCENT REVENUE BY SOURCE ARIZONA EDUCATION FUNDING	177
9-4 ENROLLMENT BY UNION HIGH SCHOOL DISTRICT: 2000	179
9-5 ENROLLMENT BY UNIFIED SCHOOL DISTRICT: 2000.....	180
9-6 SCHOOL-AGE POPULATION AND ENROLLMENT BY GRADE COHORT	181
9-7 K TO 6HT GRADE ENROLLMENT UNION HIGH SCHOOL DISTRICTS	182
9-8 7 TH TO 8 TH GRADE ENROLLMENT UNION HIGH SCHOOL DISTRICTS	184
9-9 9 TH TO 12 TH GRADE ENROLLMENT.....	185
9-10 COST OF ADDITIONAL K TO 6 TH GRADE FACILITIES UNION HIGH SCHOOL DISTRICTS	187
9-11 COST OF ADDITIONAL 7 TH TO 8 TH GRADE FACILITIES UNION HIGH SCHOOL DISTRICTS	189
10-1 LOCAL TAX RATES	193
10-2 SUMMARY OF MODEL RESULTS BY CITY	197
11-1 TRANSACTIONS PRIVILEGE TAX COLLECTIONS BY SOURCE BY MPA.....	199
11-2 RETAIL DEMAND AND SALES BY MPA BUILD-OUT	200
14-1 NATIONAL AND METRO PHOENIX AVERAGE IMPACT FEES, 2000	223
14-2 AVERAGE FEES BY REGION, SUB-REGION AND FEE TYPE.....	228
14-3 EFFECT OF MUNICIPAL IMPACT FEES ON SINGLE-FAMILY HOUSING PRICE.....	229
15-1 SALES TAXES AS A PERCENT OF LOCAL OPERATING REVENUE	236
17-1 BENEFITS OF TRANSIT ORIENTED DEVELOPMENT	252
17-2 TOD EVALUATION CHECKLIST.....	254
17-3 PEDESTRIAN-FRIENDLY DESIGN PRINCIPLES	256
17-4 PARKING MANAGEMENT STRATEGIES AND TRAVEL REDUCTIONS	258

Executive Summary

The MAG Regional Growing Smarter Implementation Project (RGSi Project), funded by the Transportation and Community System Preservation Pilot Project, has two major objectives:

1. To implement Arizona's Growing Smarter/Plus statutes through MAG member agencies and toward regional growing smarter planning in other ways; and
2. To provide MAG member agencies tools and information that can be used in local and regional planning, especially related to general plan updates occurring in response to Growing Smarter/Plus statutes, future major amendments, and major development projects.

These two major objectives are critical to transportation planning.

- The Growing Smarter/Plus statutes require that each local community must update its general plan every ten years, and must approve all major amendments to its general plan once each year. The statutes define general plan elements that must be prepared; these differ according to the population size and growth rate of the community. Generally, with larger the size and growth rate, there are more general plan elements that must be prepared. However, irrespective of size, there are two elements that are mandated: a land use element and a circulation element.
- Land use and transportation planning are inextricably fused. The location of employment and residential land uses define the structure for transportation systems.
- Regional transportation planning depends on the regional pattern of land uses. Though land use planning is statutorily a local government function in Arizona, the composite of local land plans results in planned regional land use patterns.
- The Regional Land Use Plans form an important basis for the Socioeconomic Projections that are used to develop the Regional Transportation Plan (RTP).
- Good local plans depend, among other aspects, on understanding the regional context and identifying a community's preferred functional role within the regional system.
- The RGSi Project provides an understanding of the regional context through a series of technical reports on various components of the regional system; it encouraged MAG member agency planning that includes the consideration of the regional system.

The RGSi Project provided a foundation for its first objective through MAG's Planners Stakeholders Group (PSG), whose attendees are city planning staff from 27 MAG member agencies. In addition to our statutory role in reviewing local general plans and general plan major amendments, the PSG was used as a forum for information sharing and technical discussion of possible regional policies. During the life of the RGSi project, much effort was placed in expanding attendance at monthly PSG meetings, in coordinating with member agencies who presented their draft general plans to the group, and in presenting regional information for discussion, review and feedback. The information developed in the RGSi Project provides a comprehensive technical description of the metropolitan region, and much of that information will be regularly updated in the future. Thus, when the next round of state-mandated updates to general plans will be developed in 2010, MAG member agencies will be able to utilize comprehensive regional planning information.

Additionally, the first objective of the RGSi Project was addressed through a close working relationship among MAG, the Greater Phoenix Economic Council and its Economic

Development Directors Team, and the Salt River Project. By cooperating jointly on a major sub-project that comprehensively described the region's economy, local economies, Maricopa County job centers, and job center site factors, the resulting work has been extensively used in developing a regional economic development strategy.

Finally, the first objective was addressed through a series of presentations on the results of the RGSi project to MAG member agencies and other regional groups and agencies.

The second objective – providing MAG member agencies with tools and information that can be used in local and regional planning – is the largest part of the project. There are four sets of information and tools:

1. "Best Practices" Planning Papers. The topics for these papers, chosen by the PSG, are the primary local planning problems faced by MAG member agencies. The best practices papers investigated each topic and identified best practices that are being used in both Arizona and the nation. The topics include:
 - Adequate public facilities ordinances;
 - Affordable housing policy;
 - Development impact fees;
 - Intergovernmental planning;
 - Infill development; and
 - Transit-oriented development.
2. Regional Technical Reports. There are nineteen regional technical reports that individually describe the present and projected conditions in eleven major components of the regional system. These components include:
 - Historic & future population & demographics;
 - Current affordable housing conditions;
 - Historic regional/local economies and economic development;
 - Current & future job centers;
 - Regional infrastructure demand and cost standards;
 - Current & planned regional transportation;
 - Current & future regional wastewater facilities demand & supply;
 - Current & future regional solid waste facilities demand & supply;
 - Current & planned regional open space;
 - Current & projected school enrollment and facilities demand and cost;
 - Current sales tax base; and
 - Historic local fiscal conditions and future fiscal impact of land plans.

These reports are descriptions and analyses that draw upon many databases prepared under the RGSi Project. The major databases include the following:

- Historic demographic databases on births, mortality, migration and immigration;
- Regional economy databases for the Phoenix MSA, competitor regions, local communities and job centers that include industries, industry clusters, jobs, payroll, occupations, and major employers by street address;
- Job center databases that include establishments, employers and jobs by detailed industry and by industry cluster, and that include local site factors such as infrastructure, transportation access, building availability, commute shed labor force characteristics, commute shed housing availability, and commute shed educational measures;

- Regional infrastructure demand and cost standards for water, wastewater, and solid waste management facilities;
- Regional wastewater facilities, including capacity and capacity utilization;
- Regional solid waste management facilities, including capacity and capacity utilization;
- Enrollment by grade for school districts; school facility demand and cost standards;
- Local operating revenues, including sales taxes by source, for Maricopa County cities and towns;
- Major local operating expenditures for Maricopa County cities and towns; and
- Development impact fees by type of infrastructure by MAG member agency.

Finally, three models have been developed:

1. A cohort-survival demographic model that projects persons by age, gender and race/ethnicity at the county scale;
2. A demographic model that projects persons by age & gender at the Traffic Analysis Zone scale; and
3. A fiscal model that calculates local operating revenues, operating expenditures and fiscal balance based on future land plans.

These four sets of information and tools are available to MAG member agencies for their own planning needs, and can also be used by MAG Regional Development to assist member agencies by providing a regional context for local planning and development issues.

Introduction

The MAG Regional Growing Smarter Implementation Project (RGSi Project), funded by the Transportation and Community System Preservation Pilot Project, has two major objectives:

1. To implement Arizona's Growing Smarter/Plus statutes through MAG member agencies and toward regional growing smarter planning in other ways; and
2. To provide MAG member agencies tools and information that can be used in local and regional planning, especially related to general plan updates occurring in response to Growing Smarter/Plus statutes, future major amendments, and major development projects.

The Regional Development division of MAG is working to achieve these two broad objectives on a number of fronts:

- Regional technical reports that collectively describe the Metro Phoenix region as a system and provide a regional perspective;
- Best planning practices papers on topics of common interest to MAG member agencies; and
- Activities of the Planners Stakeholders Group, an advisory group that includes all MAG member agency planners.

This final report of the Regional Growing Smarter Implementation Project summarizes two major efforts:

Regional Technical Reports

Regional Growing Smarter planning is being implemented by providing basic regional information and analyses that, in total, describe the MAG region as a system. A major component of the Regional Growing Smarter Implementation Project is a series of technical reports that collectively describe the Metro Phoenix region as a system and provide a regional perspective. There are 19 regional technical reports:

- Historic Demographics– This is a series of reports on population trends; vital statistics; in-migration and immigration; and education and labor force.
- Future Growth & Development in Greater Phoenix – This is a report on future economic, demographic and land use projections, plus their geographic distribution across the metropolitan region.
- Economic Change– This is a series of reports on regional economic trends; regional strengths, weaknesses, opportunities and threats; industry clusters of the region; subregional economies; and a shorter consolidated report.
- Job Centers – This is a report on the 106 community job centers in the region, including their economic structure and projections.
- Infrastructure Development Costs– This report covers order-of-magnitude costs of regional water, wastewater and solid waste facilities.
- Regional Transportation – This is a report on regional freeways, arterials, light rail, mass transit, airports, and freight.

- Regional Wastewater Treatment– This is a report on existing and future regional wastewater conditions.
- Regional Solid Waste Management– This is a report on existing and future regional solid waste management conditions.
- Regional Open Space – This is a report on regional open space conditions.
- Historic School Facilities– This is a report on enrollment and school facility trends.
- Future School Enrollment & Facilities – This report covers future school enrollment and demand for facilities.
- Regional Affordable Housing Assessment – This report covers affordable housing conditions.
- Historic Sales Tax Base – This is a report on sales taxes and sales tax base conditions and trends.
- Historic Fiscal Balance– This is a report on MAG member agency operations and maintenance budgets.
- Future Fiscal Balance – This report covers the future fiscal conditions arising from future land use plans by MAG member agencies.

Best Practices Papers

A second significant implementation tool of Regional Growing Smarter planning is a series of best practices planning reports on planning issues chosen by member agency planning directors that have regional applicability or the applicability of being uniformly adopted by all MAG member agencies. These reports were completely funded by the TCSP grant. Six Best Practices Papers have been completed: Adequate Public Facilities Ordinances, Affordable Housing Policy, Development Impact Fees, Intergovernmental Planning, Infill Development, and Transit-Oriented Development.

Planners Stakeholders Group

In addition to the regional technical reports and best planning practices papers, a third important component of the RGSi Project is the Planners Stakeholders Group (PSG). The activities of the PSG are more important than the informational reports, because it is a process. At the start of the TCSP grant, the PSG was sparsely attended, and without focus. During the course of the project, much effort was directed to increasing attendance. This was accomplished both by a greater emphasis on calling attendees prior to monthly meetings, and also by upgrading the content of meetings so that it is of interest and is meaningful to member agency planners.

Over the course of the grant period, all MAG member agencies that updated their general plans according to the new Growing Smarter/Plus statutes – nearly all member agencies – presented their general plans to the PSG for discussion. Additionally, during the grant period, presentations of regional information were made. Also, during the grant period, the PSG was briefed on important regional efforts underway – the Regional Transportation Plan being developed by MAG, updated socioeconomic planning projections, possible reform of the State Land Department and how it treats state trust lands and regional open space, and others. Finally, the PSG developed the initial technical framework for new MAG policies. Of these, the content of the first regional annual report for Metro Phoenix and the technical framework for conducting regional transportation impact analyses of regionally significant development projects are most important.

Presently, the PSG is well attended and has a clear role as an advisory group for MAG's Regional Development Division; and the Regional Development Division has a clear role in providing information and collaborative planning for MAG member agencies. This is summarized by the mission statement of the Regional Development Division, which was developed by the PSG in Spring, 2002:

"Facilitate collaborative regional planning with Maricopa Association of Governments member agencies, appropriate regional, state, and federal agencies, tribal governments, and the private sector resulting in a high quality of life for the citizens of the region.

The Regional Development Division will accomplish this mission through:

- Providing the best and most complete information about the physical development of the metropolitan area.
- Identifying trends, issues, and patterns regarding the physical make-up of the region.
- Providing principles of a regional perspective on the physical nature of the region to educate other agencies and the public.
- Facilitating information sharing, coordination of research, and joint planning that relates to common planning issues of member agencies."

Organization of Final Report

The Regional Growing Smarter Implementation Project Final Report is organized into five major parts. Parts I – III summarize the Regional Technical Reports, Part IV reviews the Best Practices Papers, and Part V contains the RGSi Project Evaluation Plan. Each part contains chapters detailing regional information and analysis:

Part I	Growth and Development <ol style="list-style-type: none">1. Demographic Change2. Economic Change3. Job Centers4. Projected Growth and Development
Part II	Infrastructure <ol style="list-style-type: none">5. Regional Transportation6. Regional Wastewater Treatment7. Regional Solid Waste Management8. Regional Open Space9. School Facilities
Part III	Fiscal Concerns <ol style="list-style-type: none">10. Fiscal Balance11. Sales Tax Generation
Part IV	Best Planning Practices <ol style="list-style-type: none">12. Adequate Public Facilities Ordinances13. Affordable Housing14. Development Impact Fees15. Intergovernmental Planning16. Infill Development

17. Transit-Oriented Development

Part V

Evaluation Plan

18. Evaluation Plan

All sections and pages have been numbered consecutively to provide continuity and easier reference throughout the document. Figures and tables are numbered in accordance with the chapter in which they appear.

PART I GROWTH AND DEVELOPMENT

1. Demographic Change

A fast growing and diversifying population are the hallmarks of Maricopa County's demographic change. Among the more significant historic trends are: large increase in the number of very young and very old people; the sharp rise of the Hispanic population of all ages; modest growth of the Black and Asian populations; and the steady attraction of prime working-age persons (age 20 to 34). Analysis of demographic information shows a significant increase in the Hispanic share of the population, with an even larger share of births but a smaller share of deaths.

Total Population

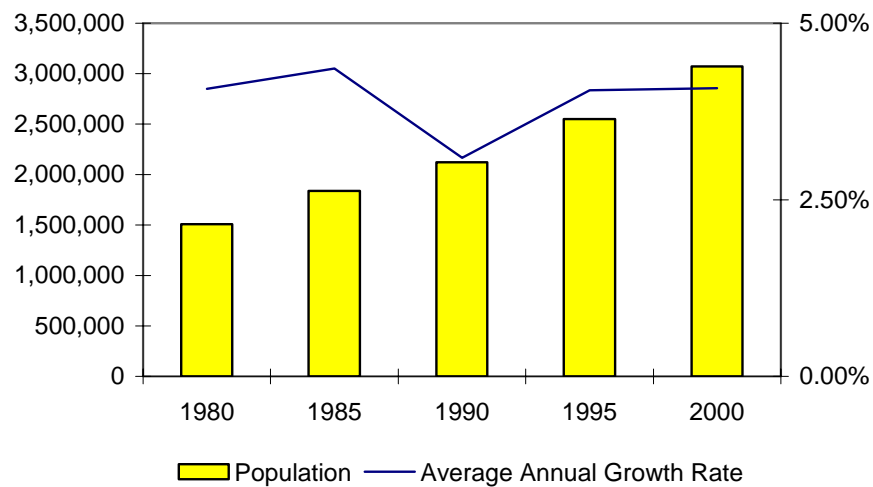
The population in Maricopa County experienced tremendous growth through the 1980's and 1990's. In 1980, the number of residents totaled little over 1.5 million, as seen in Figures 1-1 and 1-2. By the year 2000, that number had almost doubled to just over 3 million inhabitants. Average annual growth rates were high during this time period, ranging from 3.09 to 4.36 percent, implying a rapidly expanding base which makes the growth rates that much more impressive. The five-year absolute population increases of approximately 329,000, 284,000, 430,000, and 520,000 in each respective period, place Phoenix growth among the top-tier for all large metropolitan areas.

**FIGURE 1-1
TOTAL POPULATION
MARICOPA COUNTY**

Year	Female	Male	Total	Average Annual Growth Rate
1980	769,261	739,791	1,509,052	
1985	926,149	911,807	1,837,956	4.36%
1990	1,077,866	1,044,235	2,122,101	3.09%
1995	1,270,191	1,281,574	2,551,765	4.05%
2000	1,535,676	1,536,473	3,072,149	4.08%

Source: Bureau of the Census, 1980, 1985, 1990, 1995, 2000.

**FIGURE 1-2
TOTAL POPULATION AND GROWTH RATE
MARICOPA COUNTY**

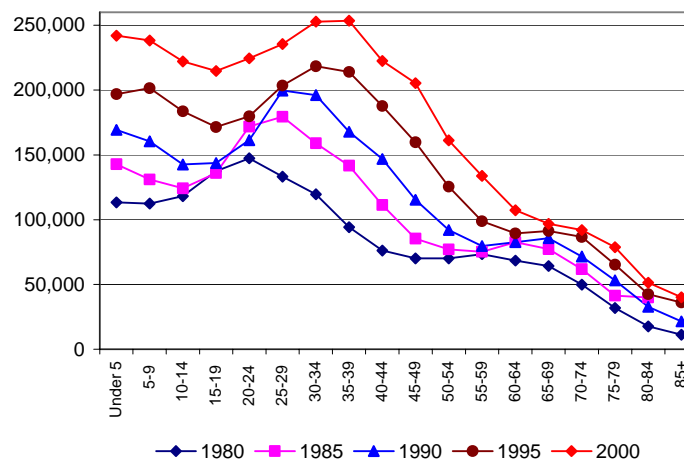


Source: Bureau of the Census, 1980, 1985, 1990, 1995, 2000.

Age Composition

Phoenix has generally had a reputation of being a prime location for retirees from all parts of the United States because of its mild winters and low humidity. However, retirees are by no means the largest age cohorts in Maricopa County and the composition of the population in terms of age has fluctuated considerably since 1980. Figure 1-3 shows the overall population in Maricopa County by age cohort in each census year. The upward shift denotes the total increase in population. While growth has occurred in each age cohort, the baby boom population has shifted the peak of the age curve to the right over time, despite which median age has declined due to a steady flow of young arrivals.

**FIGURE 1-3
POPULATION BY AGE COHORT
MARICOPA COUNTY**



Sources: U.S. Bureau of the Census, 1980, 1985, 1990, 1995, 2000; Applied Economics, 2001.

Race and Hispanic Origin of the Population

Even more significant than the overall growth of the population by age are the changes in the racial and ethnic composition of the population. In general, growth was observed across all the minority groups, with the largest increase observed in the Hispanic population. Figure 1-4 shows the population distribution by race and Hispanic origin during the five census years.

**FIGURE 1-4
POPULATION BY RACE AND HISPANIC ORIGIN
MARICOPA COUNTY**

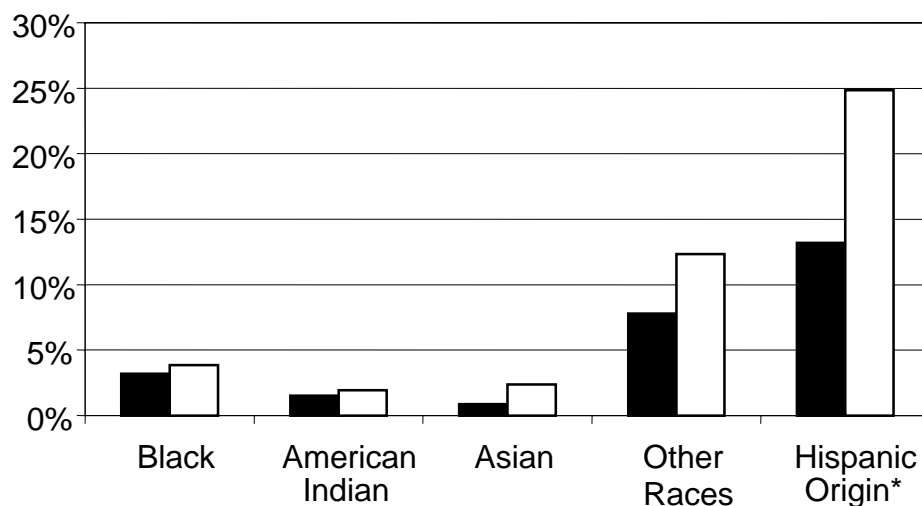
Year	White	Black	American Indian	Asian	Other	Hispanic*	Total
1980	1,307,455	48,113	22,903	13,119	117,462	199,003	1,509,052
1985	1,583,722	58,404	25,658	23,996	146,176	242,773	1,837,956
1990	1,801,570	74,295	38,309	35,208	172,719	340,117	2,122,101
1995	2,153,447	93,358	45,843	51,231	207,886	522,487	2,551,765
2000	2,442,448	118,770	59,138	73,068	378,725	763,341	3,072,149

Sources: Census of the Bureau, 1980, 1985, 1990, 1995, 2000; Applied Economics, 2001.

* Hispanic persons are included in all races.

While the minority population has grown quickly since 1980, in absolute terms the increases in Other Race and Hispanics are probably more significant in altering the racial composition of the population (Figures 1-5 and 1-6). The White share of the population dropped from 87 to 80 percent of the total.

**FIGURE 1-5
POPULATION COMPOSITION BY RACE AND HISPANIC ORIGIN
MARICOPA COUNTY, 1980, 2000**



Sources: U.S. Bureau of the Census, 1980, 1985, 1990, 1995, 2000; Applied Economics, 2001.

Arguably the most prominent change in the ethnic composition of Maricopa County has been the increase in the Hispanic population, jumping from about 13 percent of the population in 1980 to just under 25 percent in twenty years.

**FIGURE 1-6
RACE AS PERCENTAGE OF TOTAL
MARICOPA COUNTY**

	White	Black	American Indian	Asian	Other	Hispanic Origin*
1980	86.6%	3.19%	1.52%	0.87%	7.78%	13.19%
1985	86.2%	3.18%	1.40%	1.31%	7.95%	13.21%
1990	84.9%	3.50%	1.81%	1.66%	8.14%	16.03%
1995	84.4%	3.66%	1.80%	2.01%	8.15%	20.48%
2000	79.5%	3.87%	1.92%	2.38%	12.33%	24.85%

Sources: U.S. Bureau of the Census, 1980, 1985, 1990, 1995, 2000;
Applied Economics, 2001.

* Hispanic persons are included in all races.

Migration

Migration data for Maricopa County was obtained from the United States Internal Revenue Service for the years 1984 through 1999. This source provides annual immigration (in-migration) and emigration (out-migration) data based on tax claims filed each year and as such, they offer an excellent starting point for identifying migration patterns. The number of returns can be used to estimate the number of households while the number of exemptions approximates population. The IRS data provides information as to the origin and destination of migrants in and out of Maricopa County. Figure 1-7 highlights the top states of origin and destination for migration in Maricopa County. The two states that provide the most migrants to and from Maricopa County, by an overwhelming margin, are Arizona and California. This reflects a very high migrant intra-state population within Arizona, as well as significant movement to and from California. The states with the highest net migration are California, Illinois, Michigan, and Texas.

FIGURE 1-7
TOP 15 STATES OF ORIGIN AND DESTINATION
MIGRATION TO AND FROM MARICOPA COUNTY, 1984-1999

In-Migration			Out-Migration			Net Migration		
State	Returns	Exemptions	State	Returns	Exemptions	State	Returns	Exemptions
California	146,514	297,079	Arizona	122,853	253,966	California	35,526	96,557
Arizona	122,640	241,786	California	110,988	200,522	Illinois	28,976	55,772
Illinois	45,955	85,927	Texas	30,782	63,616	New York	17,028	32,295
Texas	38,956	79,852	Colorado	27,241	52,205	Michigan	12,046	20,894
Colorado	36,837	69,171	Washington	20,754	39,596	Colorado	9,596	16,966
Washington	23,861	45,430	Nevada	19,369	38,064	Ohio	8,553	13,996
Foreign			Foreign					
Address	23,568	45,270	Address	16,492	32,278	New Jersey	8,398	15,756
New York	24,716	44,739	Illinois	16,979	30,155	Texas	8,174	16,236
New Mexico	21,052	42,837	New Mexico	13,663	28,704	Minnesota	7,756	13,292
Michigan	20,557	36,676	Florida	13,832	25,881	Wisconsin	7,678	12,805
Utah	14,943	35,060	Oregon	12,315	24,686	Pennsylvania	7,575	12,966
Florida	17,479	32,330	Utah	10,536	24,611	New Mexico	7,389	14,133
Ohio	17,355	31,004	Ohio	8,802	17,008	Iowa	5,583	8,926
Nevada	15,364	29,274	Michigan	8,511	15,782	Indiana	5,310	9,388
Minnesota	15,657	27,488	Minnesota	7,901	14,196	Massachusetts	4,703	8,300

Source: IRS, Statistics of Income, 1984 to 1999.

The leading metropolitan origin of immigrants and destinations of emigrants from Maricopa County from 1984 through 1999 are generally cities within the leading origin states (Figure 1-8). Again, cities in California and Arizona dominate the list, which may reflect the temporary nature of many immigrants to the Phoenix area. Geographic, climatic, and economic similarities of Phoenix, Tucson, Las Vegas, and the Southern California cities are the key factors promoting migration among these areas.

FIGURE 1-8
TOP 15 METROPOLITAN AREAS OF ORIGIN AND DESTINATION
MIGRATION TO AND FROM MARICOPA COUNTY, 1984-1999

In-Migration			Out-Migration			Net Migration		
City	Returns	Exemptions	City	Returns	Exemptions	City	Returns	Exemptions
Los Angeles	41,433	85,689	Tucson	27,406	49,768	Chicago	23,641	46,374
Chicago	37,490	70,578	Los Angeles	24,432	40,712	Los Angeles	17,001	44,977
Tucson	34,668	63,185	San Diego	20,628	35,915	Tucson	7,262	13,417
San Diego	19,360	37,273	Las Vegas	16,055	31,865	Detroit	6,936	12,355
Denver	18,900	35,893	Denver	14,718	27,889	Minneapolis	5,559	9,476
Riverside	15,808	34,802	Flagstaff	14,404	26,419	New York	5,405	10,696
Anaheim	17,297	34,567	Chicago	13,849	24,204	Boston	4,929	8,803
Flagstaff	14,850	26,846	Riverside	11,450	23,980	Nassau, NY	4,657	9,343
Salt Lake City	9,652	22,481	Anaheim	13,133	23,437	Riverside	4,358	10,822
Seattle	12,208	22,393	Seattle	11,633	21,264	Denver	4,182	8,004
Las Vegas	11,477	22,090	Portland	8,409	16,907	Anaheim	4,164	11,130
Minneapolis	12,612	22,053	Salt Lake City	6,885	16,183	Philadelphia	3,632	6,646
Detroit	11,984	21,720	Dallas	7,627	15,033	Milwaukee	3,604	6,305
Albuquerque	9,845	19,513	Albuquerque	6,593	13,039	Albuquerque	3,252	6,474
Dallas	8,762	17,533	Minneapolis	7,053	12,577	Colorado Springs	2,905	5,137

Source: IRS, Statistics of Income, 1984 to 1999.

Immigration and Naturalization Service Data

The State of Arizona averaged only about 1.2 percent of total legal migration in the United States from 1982 through 1998. That share was higher in 1990 through 1992, which also corresponds with a rise in the overall number of immigrants admitted in the United States. These years were the only time that Arizona's share of legal immigrants exceeded its population

share. In general, Arizona had less international immigrants than overall population share during this time period.

While Arizona may not be a leading state for legal migration, it is among the top ten states with the largest illegal immigrant population. According to the INS statistics for 1992 and 1996, Arizona had an estimated 57,000 and 115,000 illegal immigrants (Figure 1-9).

FIGURE 1-9
ESTIMATED ILLEGAL IMMIGRANT POPULATION
ARIZONA AND UNITED STATES

Year	Arizona	United States
1992	57,000	3,379,000
1996	115,000	5,000,000

Source: INS, 1996, 1992.

While Arizona is among the top 10 states in terms of illegal alien population, in 1996 it only accounted for 2.3 percent of the estimated illegal population in the United States. California is estimated to have the largest share of illegal immigrants, about 43 and 40 percent in 1992 and 1996, respectively. California, Texas, New York, and Florida combined have an estimated 70 percent of the total illegal alien population in the United States

Maricopa County receives relatively few legal immigrants each year, averaging about 7,000 annually from 1991 to 1998. The estimated illegal immigrant population statewide increased about 25 percent yearly from 1992 through 1996 to about 115,000. However, illegal border crossing in Arizona has increased dramatically between 1991 and 1998, as the area has seen more detentions and a higher share nationwide.

Study Migration Estimates

The age groups with the highest net migration are the 20 through 40 age groups, indicating the influx of young workers to Maricopa County.

Migration trends among each race and sex groups varied significantly throughout the period. The migration of the White female and male populations are the largest and most prominent; therefore the trends are very similar to those of the county totals. The net migration of the American Indian and Black racial groups reflect more erratic trends than the White primarily due to small population bases. Net migration of the Asian and Other race groups shows smoother curves across the age groups. These races reflect general countywide trends of higher immigration of the working age cohorts.

One of the more interesting findings of this study is a noticeably low amount of Hispanic deaths and high amount of Hispanic births compared to those of the population as a whole (Figure 1-10). Post-1985 Hispanic migration accounts for an increasing share of total migration to Maricopa County, topping 40 percent in 1990-95 (Figure 1-12).

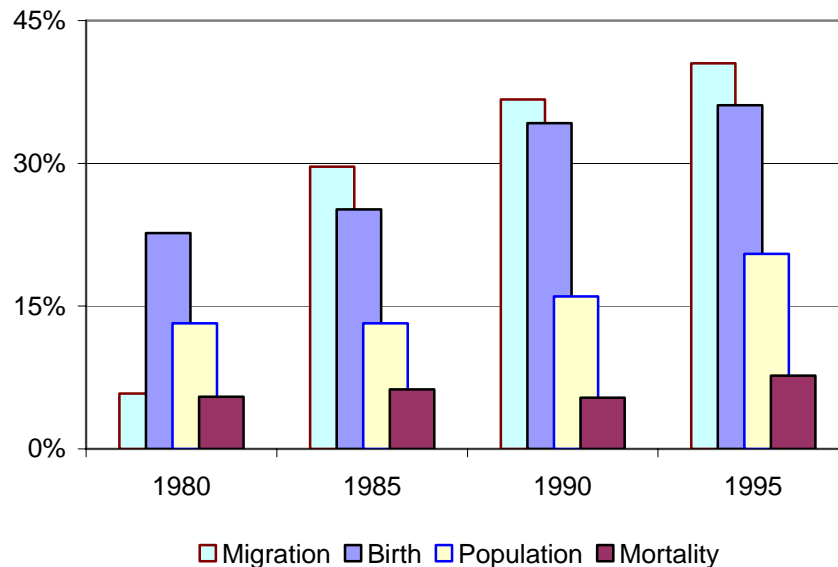
FIGURE 1-10

**HISPANIC SHARE OF TOTAL POPULATION
MARICOPA COUNTY**

	1980	1985	1990	1995
Births	22.67%	25.16%	34.20%	36.11%
Population	13.19%	13.21%	16.03%	20.48%
Deaths	5.47%	6.23%	5.39%	7.69%
Migration	5.81%	29.65%	36.69%	40.48%

Sources: U.S. Census Bureau, 1980-1995; Arizona Department of Health Services, 1979-1996; Applied Economics, 2001.

**FIGURE 1-11
HISPANIC SHARE OF TOTAL POPULATION
MARICOPA COUNTY**

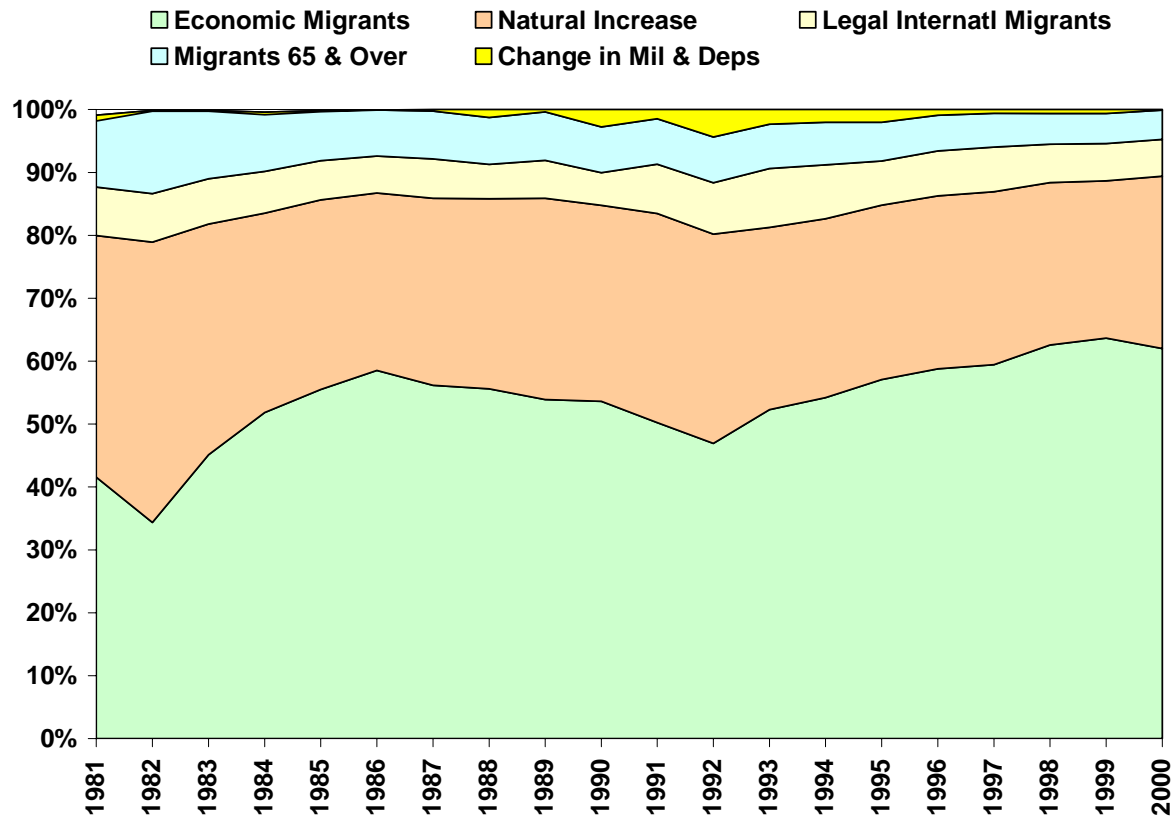


Sources: U.S. Census Bureau, 1980-1995; Arizona Department of Health Services, 1979-1996; Applied Economics, 2001.

Population Change by Component

Population change in Maricopa County since 1980 has primarily been spurred by migration, specifically economic migration (Figure 1-12). In 1981, natural increase was 39% of total population change, dropping to 27% by 2000. Economic migration grew from 42% of total population change in 1981 to 62% in 2000. Retirement migration – migration of persons 65 years and older – dropped from 12% of total population change in 1981 to just 5% in 2000. Legal immigration was 8% of total population change in 1981, but had dropped to 6% in 2000.

**FIGURE 1-12
COMPONENTS OF POPULATION CHANGE
MARICOPA COUNTY, 1981-2000
(000 PERSONS)**



Source: Regional Economic Models, Inc.

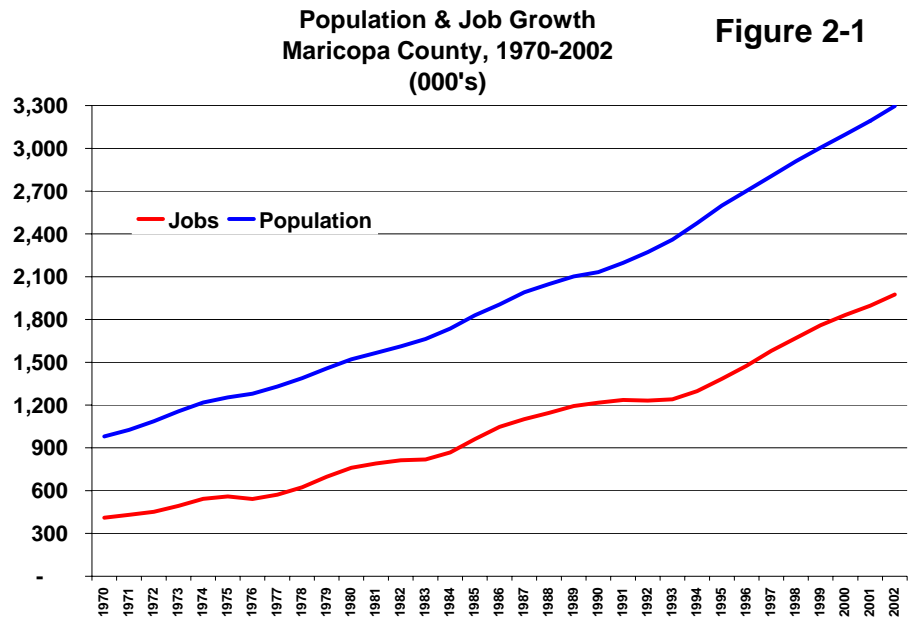
2. Economic Change

This chapter covers a series of reports on regional economic trends, regional industrial clusters, strengths, weaknesses, opportunities and threats (SWOT), and sub-regional economies. These analyses, developed jointly with the Greater Phoenix Economic Council and the Salt River Project, will be used by regional and local economic developers in the Greater Phoenix region in prioritizing industry targets and establishing supporting economic development policies aimed at fostering a sustainable, high value-added economy.

2.1 Economic Effects of Sheer Growth

The outstanding characteristic of the Greater Phoenix economy is its sustained rapid growth. For the past 30 years, its growth rate has been nearly three times greater than the nation.

However, as strong as is economic growth in Greater Phoenix, it has not kept up with population growth. There is somewhat of a disconnect between population growth and job growth in Greater Phoenix; even during the current economic slowdown, population growth has averaged 110,000 persons annually.



What does that mean for the regional economy?

- It disproportionately contains industries that respond to sheer growth – construction, real estate & utilities.
- It is disproportionately weighted to industries that are supported by consumer demand – retail, personal services, health services, and local government.

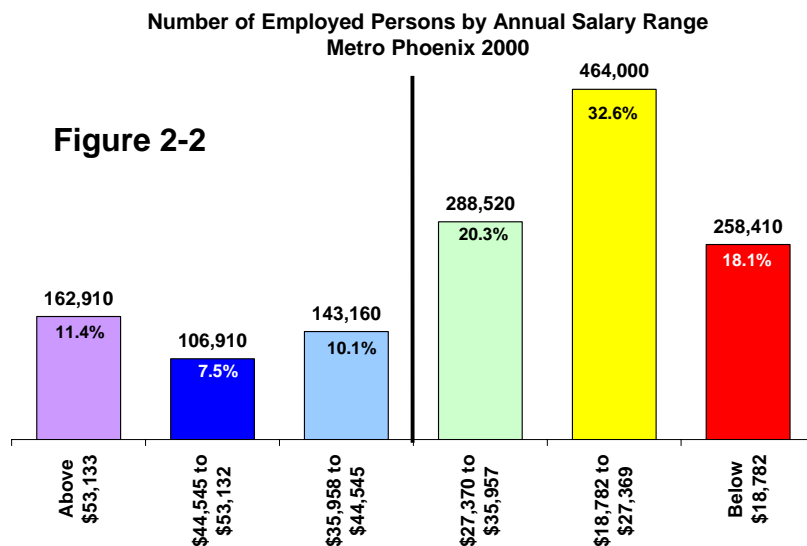
Despite the magnitude of growth, the Greater Phoenix economy has certain weaknesses:

- A low-cost, low wage economy.
- A weak economic base.
- Little economic diversity.

2.2 Low Wage Economy

One of the major economic issues for Greater Phoenix is that its economy produces low-wage jobs. The average annual earnings in the metro region were just under \$36,000 in 2000.

- 71% of wage and salary jobs paid below average earnings.
- 18% of these jobs were below \$9/hour.



2.3 Greater Phoenix Industry Clusters

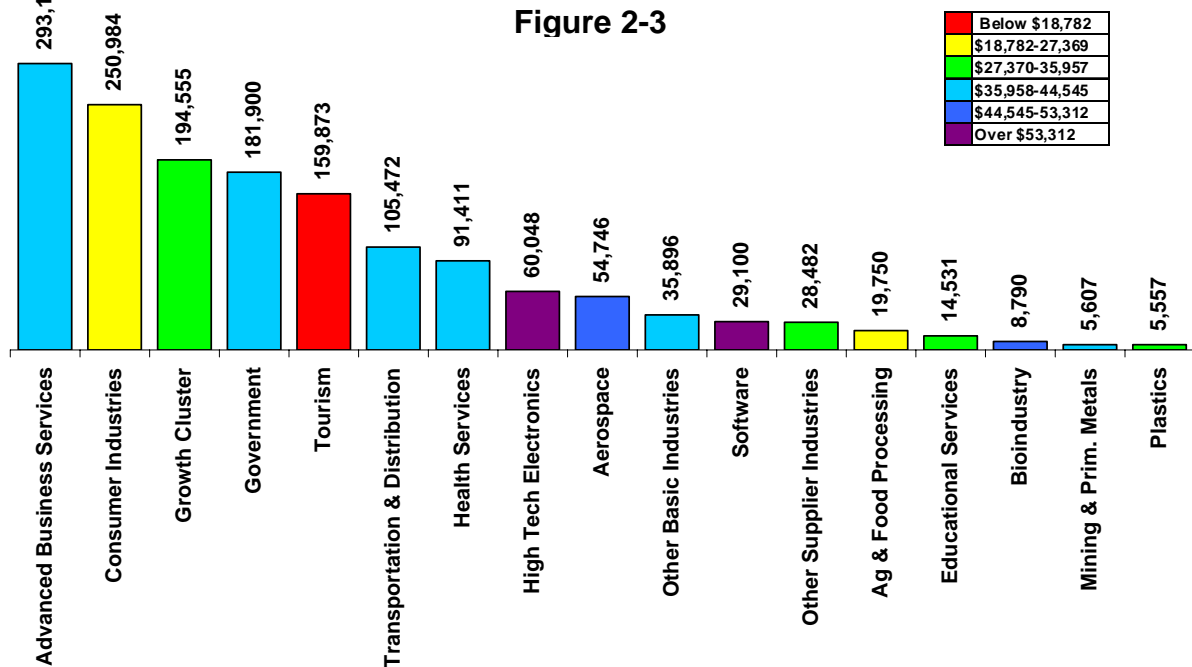
There are 17 industry clusters that make up the economic base of Greater Phoenix.

- 12 of these are composed of basic industries and their suppliers.
- Nonbasic clusters include consumer industries, growth cluster, government, health services and educational services.

Ten clusters pay average wages that are above the region's mean, and 4 clusters pay average wages that are in the highest two categories:

- High tech/electronics
- Aerospace
- Software
- Bioindustry

Industry Cluster Jobs by Wage Category
Maricopa County, 2000
 (Source: Minnesota IMPLAN & U.S. Bureau of Labor Statistics)



2.4 Economic Change During The 1990's

The concentration of job change was pronounced during the 1990's – 87% of all new jobs were in just 7 of the 17 industry clusters.

- The top 3 non-basic industries accounted for 44% of all job growth.
- The highest wage basic industry clusters accounted for only 8% of job growth.

Thus, the 1990's were not good to Greater Phoenix's basic industries, especially its traditional high tech electronics and aerospace industries.

In general, Greater Phoenix did not just “not grow” some elements of a diversified, vibrant economy; instead, it “lost share” of high value-added elements that had previously existed:

- Digital Equipment & Honeywell computer operations;
- Motorola's Semiconductor regional headquarters;
- Goodyear Aerospace/Loral;
- Several castings companies that used to supply copper mines; and
- Williams Air Force Base.

Change in Industry Cluster Jobs, 1990's

Industry Clusters	1990's Job		Cumulative	
	Change	Basic	Nonbasic	Share
Advanced Business Services	156,750	156,750		28.2%
Growth Cluster	92,137		92,137	16.6%
Consumer Industries	79,022		79,022	14.2%
Government	47,300		47,300	8.5%
Tourism	47,032	47,032		8.4%
Transportation & Distribution	36,013	36,013		6.5%
Health Services	27,991		27,991	5.0%
Software	19,303	19,303		3.5%
High Tech/Electronics	10,249	10,249		1.8%
Other Supplier Industries	9,006	9,006		1.6%
Aerospace/Aviation	8,888	8,888		1.6%
Other Basic Industries	8,120	8,120		1.5%
Educational Services	7,536		7,536	1.4%
Bioindustry	3,975	3,975		0.7%
Agriculture & Food Processing	2,080	2,080		0.4%
Plastics & Advanced Composites	1,446	1,446		0.3%
Mining & Prim. Metals	(193)	(193)		0.0%
Total Wage & Salary Jobs	556,655	302,669	253,986	100.0%

The cumulative effect of these losses, combined with their replacement by other kinds of industries, is dramatically shown by the historical concentration of basic industry clusters.

- All high tech industries (electronics, aerospace, bioindustry & software) fell from a concentration ratio of 2.6 times greater than the nation in 1969 to below 1.4 in 2000.
- This high value-added segment of the region's economy was replaced by the low-wage part of advanced business services, by the growth cluster (which is not basic), by high-wage advanced business services, and by tourism.

2.5 Regional Economic Development Strategy

In response to the various challenges that face the regional economy, the Greater Phoenix Economic Council's (GPEC) regional economic development strategy is to develop a targeted number of direct jobs in each of the high-wage target clusters by 2010:

- Advanced business services – 27,700 new jobs
- Aerospace & aviation – 12,300 new jobs
- High tech electronics – 20,500 new jobs

**Location Quotients, Selected Industry Clusters
Maricopa County, 1969-2000**

Source: Regional Economic Models, Inc.

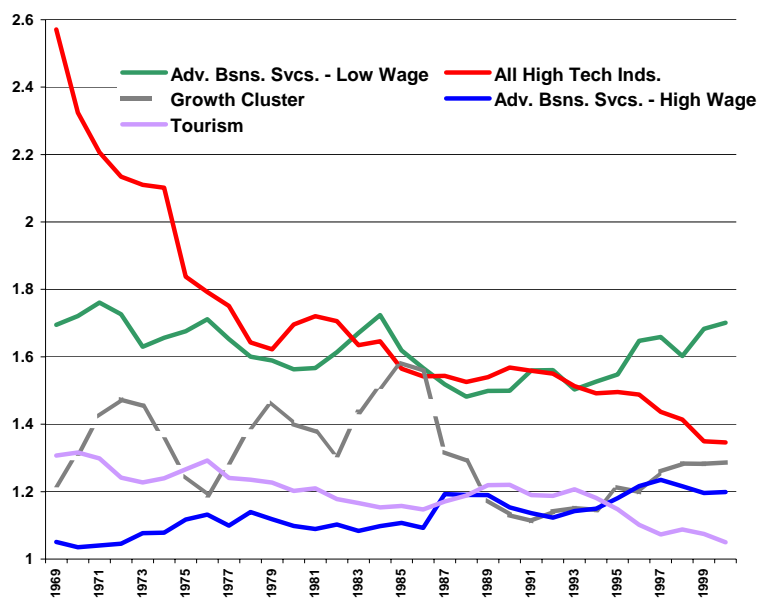


Figure 2-4

- Software – 32,500 new jobs
- Bioindustry – 12,900 new jobs

The goal is that one of every six new jobs created will be in the high wage clusters. These goals will be accomplished by the regional and local organizations in Greater Phoenix involved in economic development working cohesively together to ensure that all activities of business development in the region – attraction, expansion & retention, and new company start-ups – are aligned with the strategy.

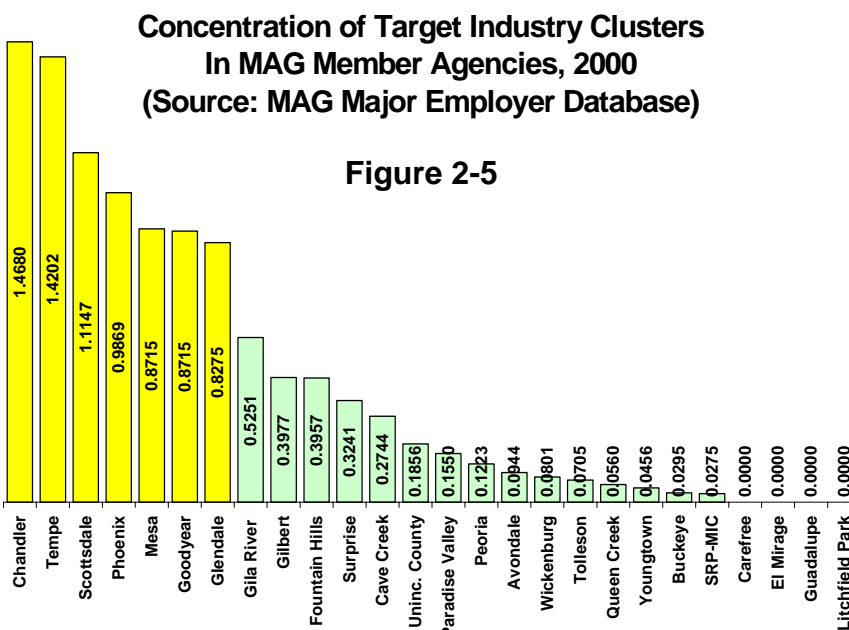
2.6 Sub-Regional Economies

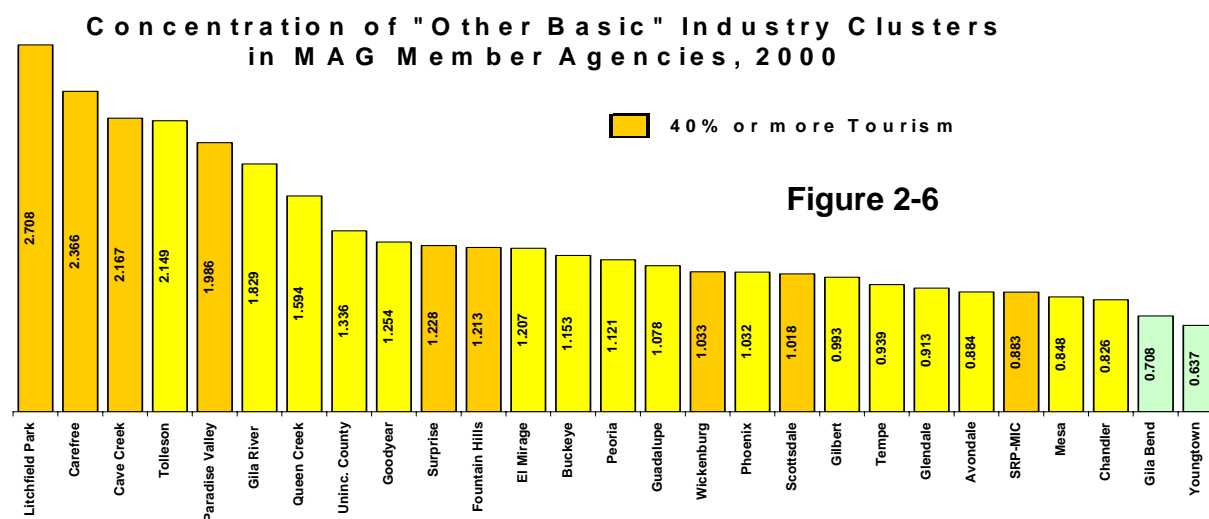
A key point about the GPEC target industry clusters is that there are a handful of communities in Maricopa County that are most competitive.

Based on MAG's employer database, these figures show concentration ratios for all GPEC target industry clusters and for all other basic industry clusters by community in 2000.

- After the top seven communities – Chandler, Tempe, Scottsdale, Phoenix, Mesa, Goodyear, and Glendale – there is a significant drop of concentration for the high-wage target clusters.
- In contrast, there is a widespread distribution of all other basic industry clusters among other communities. In many of these, tourism is the most prominent sector.

This indicates the need for continued regional development of the non-priority industry clusters.





2.7 Regional Strengths, Weaknesses, Opportunities & Threats

A recent series of major studies, reports and strategies about the economy and economic development issues of the region is summarized in this chapter in three sections:

1. **Long-Term Changes.** Its purpose is to orient economic development strategies well beyond the near term, looking at trends that are 10 to 50 years in the future.
2. **Opportunities and Threats.** This section describes trends and possible change in the short to mid-term that present possible economic development opportunities and threats.
3. **Site Factors at the Regional Level: Business Climate Strengths and Weaknesses.** This section focuses on site factors that industry considers when locating to an area. The section is organized according to various site factors, and presents the regional strengths and weaknesses for each.

2.7.1 Long Term Change

High Population Growth Will Remain for at Least 50 Years:

Table 2-1. Population Growth (Millions)				
	2000	Projections		
		Low	Medium	High
World, 2050	6,057	7,866	9,322	10,934
US, 2050	281.4	313.5	403.7	552.7
Annual US Immigration, 2050	1.1	0.6	1.3	1.4
Maricopa County, 2040 ¹	3.1	NA	7.3	NA

Global Trading Blocks Will Emerge:

- NAFTA likely expand to include South America.

¹ Maricopa Association of Governments, interim draft projections subject to change, May 2003.

- East Asia & Europe emerge as more formal trading blocks.
- Growth of huge China market and its entrance into the World Trade Organization will generate major shifts in global trade patterns.

Technology Change Will Create New Products & Industries:

- Science will be the undisputed primary driver of economic and cultural change in the twenty-first century. It is now clear that the entire digital revolution is only the first phase of an even larger, longer process. In the first phase, information technology revolutionizes biology. In the next phase, biology will revolutionize information technology. And that will totally, once again, revolutionize economies. The next 100 years will include the following five general trends:
 - Movement away from a silicon-based electronics economy.
 - Increased rates of technical advance and revolutionary breakthroughs on the smallest of scales (even molecular manipulation).
 - The nanotechnology - the science of the extremely small - wave of technology integration and societal transformation (artificial cells, artificial enzymes).
 - Convergence of diverse fields of study and development, such as information technology and biotechnology.
 - Genetically modified everything.²

Most Significant Technologies of the 21st Century:

- Computers. Computers will become powerful extensions of human beings designed to augment intelligence, learning, communications & productivity.
- Networks. The Internet will become the first global knowledge network connecting billions of people with an unlimited number of channels.
- Biotech. The convergence of biotech and computers will accelerate the genetic redesign of all living things.
- Nanotech. Nanotech enterprises will provide the ultimate convergence of computers, networks, and biotech, and create products never before even imagined. Nanotech will revolutionize the global economy, providing power tools that will manufacture high-tech products with low-cost and low-tech resources.
- Space. Many innovations will accelerate the establishment of a global space market.

² Morrison Institute, *Five Shoes Waiting to Drop*, 2001.

2.7.2 Regional Opportunities and Threats

The following table summarizes regional opportunities and threats according to economic topic.

Topic	Opportunities	Threats
Global Economy		Terrorism & war in unstable regions
Emergence of global trading blocks	Improved demand for US exports and US-made capital equipment and knowledge-intensive services. China market.	Southeast Asian economies shift toward higher-value goods and services, competing with US
Increased standardization in existing high-tech industries	Increased importance in US for developing emerging industries	Will lead to further transfers of business operations to low-cost economies
Mexico, CANAMEX Corridor, Southwest Passage	Maquiladoras have less reason to locate close to US border. Lengthening transport links between production locations as Hermosillo, Guadalajara and even Monterrey with markets in the Southwest and Pacific Northwest place Arizona squarely in the middle of this pattern. Further improvements of trade links to Mexico would help redefine Arizona as a hub and as an integral part of the CANAMEX region	Short-term decline in maquiladoras will create further incentives for Mexican immigration
National Economy	US macroeconomic outlook over next decade is bright. Nation's business cycle becoming less volatile Heightened pace of technological change; diffusion of technology is more rapid.	Shorter product cycles caused by tech change causes manufacturing plants to become obsolete more quickly than in the past. Product manufacturing will be an increasingly volatile activity in terms of capacity and location
New Economy	People or talent is the key factor of production in this new system. A region's future will be increasingly decided by its ability to attract people than to attract firms.	Dispersion of talent and technology to various parts of the country and the world has altered the once-fixed geographies of talent. Terrorism potential to demolish agglomeration economies.
		Arizona suffers from an image problem among the cutting-edge young knowledge workers. Arizona lacks the urban fabric, "coolness" and public schools they want.
Arizona Economy		Arizona no longer has a balanced and efficient tax structure.

Topic	Opportunities	Threats
Greater Phoenix Economy	In large measure, Phoenix is built on the fact that people want to be here – as a place to live, work, and/or retire because they enjoy the lifestyle.	
Stable industries of the coming decade	Air transportation Electronic components & accessories manufacturing Measuring & controlling instruments Aircraft & parts manufacturing Restaurants Insurance carriers, esp. regional and back-office ops. Real estate & insurance agents Federal government Farm labor & management services	<u>Downside risks:</u> Airline industry in serious financial trouble. Electronics manufacturing faces serious competitive threats from overseas producers. electronics health depends on amount of research & development work that continues locally and that generates new products Phoenix hotels, restaurants & resorts hard hit by 9-11
Growth industries of the coming decade	Amusement & recreation Public relations & management services Missiles and space vehicles Banking industry Business services, including software & temporary help services Defense spending impact on aircraft & parts industry Tourism - if it had a larger component within cultural activities and the arts Hotels and lodging - after current oversupply wears off Trucking & general transport services Arrangement of transportation services	<u>Downside risks:</u> Transportation services will have to change rapidly as ticketing & freight brokerage services & logistics come to rely increasingly on the Internet. Banking industry - not likely to accelerate unless regional or national financial service operations stake a greater presence in Arizona and adapt to changing financing needs of emerging industries
Industries subject to waning demand in Greater Phoenix		Semiconductors & other electronic equipment Aerospace
Healthcare/Bioindustry	Development of cutting edge science and technology, and their application to business enterprise creates viable bio-industry cluster stemming from Translational Genomics Institute and other improvements made to attract it.	Direct impact of biotechnology can be limited. Not profitable business in the aggregate, and probably remains unprofitable in the next decade. Arizona industry faces long-term battle to establish itself versus high concentrations elsewhere.

2.7.3 Site Factors: Regional Business Climate Strengths and Weaknesses

The following table summarizes regional strengths and weaknesses according to various site factors.

Site Factor	Strengths	Weaknesses
Economic Vibrancy	State ranks well on measures of innovation Top-ranked region in terms of high technology location and growth	3d tier in several industry R&D measures 3d tier average yearly growth of high-tech industries An economic base dependent on only a few driver industries
Access to Markets	Multi-state regional markets Proximity to international markets	In terms of geographic location, Phoenix is in many ways more of a way station between southern California and Texas rather than a node or hub
Transportation Services	Direct air flights – 126. Sky Harbor positive factor, with sufficient capacity including parallel runways and ample gate and terminal space over next ten years. Above average government outlays on air transport Williams Gateway available as a reliever airport, which Sky Harbor will need to protect its effectiveness Robust freight trucking industry	Traffic at the airport, congestion within the airport, and complaints regarding air travel could become a barrier to growth. Rail access diminished with Union Pacific abandonment of mainline; adds time delay for freight scheduling.
Telecommunication Services	Telecommunications access is plentiful for both telephone and broadband service 2d tier percent of households with computers and Internet access (2000) 2 communications satellites can be seen, unlike just one for most locations	Access to best telecom services is still an issue in some communities
Access to Resources	Energy costs 20% lower than California	Cost of electricity for industrial users 8% above national average
Work Force	Favorable demographic trends Overall workforce availability is good Workforce quality is favorable Top ten states for intensity of engineers 2d tier intensity of computer & information science experts, 2000 2d tier percent of population with advanced and bachelor's degrees, 2000 2d tier science & engineering post-doctorates awarded per 100,000 people, 1998 2d tier doctoral engineers per 100,000 people	Shortages in some skilled machine trades, technical & professional occupations Low share of higher education students as % of population 3d tier percent of population with PhD degree

Site Factor	Strengths	Weaknesses
Space Availability & Cost	<p>Infrastructured land of appropriate size</p> <p>Favorable real estate prices</p> <p>Existing building space availability is good</p>	<p>Projects usually locate into existing space, and some communities lack these.</p> <p>Continual threat of converting industrial land needed for economic base development to residential because of real estate opportunities due to population growth. Strong need to protect nonresidential land, especially after infrastructure investments made for economic base development.</p>
Financial Capital	Second tier among states for certain financial measures.	Weak capital formation. There is a mismatch between the amount of innovation that takes place in the economy and the financial resources available to turn the innovation into commercial products.
Public Sector Investments		
Secondary Education Quality	2d tier average SAT scores 2001	Last in nation in terms of high school completions. 47th in nation for high school grads going to college.
Higher Education Quality	<p>Strong community college system</p> <p>Dynamic university & college presence</p> <p>High share of college degrees conferred</p> <p>Significant assets in state university system</p>	Funding deficiencies for Arizona's higher-education facilities compromises its competitiveness as a center for research & innovation in the nation
Infrastructure Capacity	Substantial infrastructure investments by local governments	Physical infrastructure and its funding will have to keep pace with the growth of Greater Phoenix
Cost of Living	When compared to other tech centers nationwide, Greater Phoenix fares better on living costs	Every year since 1995, increase in median sales price of single family housing has outpaced household income growth
Climate/Physical Environment	Trend of less air pollution measured by number of days not meeting US EPA air quality standards	Measures to improve air quality will be increasingly important as population and the economy expands.
Recreational & Cultural Amenities	Considerable cultural and recreational activities	
Personal/Property Security		Crime rate at 63.7 reported crimes per 1,000 persons, well above national rate of 42.7. Teen pregnancy rate highest in Arizona, among highest nationwide
Area Image	Corporate executives' positive images of Greater Phoenix (more than 50% of respondents)	Arizona's deep, broad and longstanding economic sectors - tourism, golf, construction and

Site Factor	Strengths	Weaknesses
		retirement - are based on the state's traditional "old economy" assets such as climate and low costs. These realities, along with other factors, set Arizona up for "blue collar" status in the new economy.

¹ Information sources for the SWOT analysis include the following:

Canton, James, *Techno futures*, 2001.

Economy.com, *State Economic Study, Phase II*, Summer 2002.

Florida, Dr. Richard, *speech at Greater Phoenix Economic Council Summit*, 2001.

GPEC Competitiveness Committee, *Framing the First Year Charge: 2002 Report & Recommendations*, 2002.

Greater Phoenix Economic Council, *Survey of Corporate Executives*, Summer 2002.

Greater Phoenix Economic Council, *Survey of Site Selection Consultants*, Summer 2002.

Kotkin, Joel, *The Declustering of America*, *The Wall Street Journal*, August 15 2002.

Maricopa Association of Governments, *draft projections subject to change*, October 2002.

Maricopa Association of Governments, Greater Phoenix Economic Council and Salt River Project,

Maricopa County Regional & Local Economic Developers Survey, Summer 2001.

Maricopa Association of Governments, *Regional Council Presentation*, 1998.

Maricopa Association of Governments, *Regional Growing Smarter Implementation Project – Demographic Trends*, 2001.

Milken Institute, *State Technology and Science Index*, September 2002.

Morrison Institute, *Five Shoes Waiting to Drop*, 2001.

2.8 Sub-Regional Strengths, Weaknesses, Opportunities, And Threats

Analysis Model Structure

The information in this section is taken from an inventory of site factor conditions pertaining to job centers³ and their commute sheds⁴. In order to summarize this voluminous information in an evaluative format that is easier to grasp, an analysis model was prepared that would provide a quantitative assessment of job centers' attractiveness for each of the clusters addressed in this study. In essence, the model matches industry cluster *need* for local site factors with the competitiveness of local site factors.

While this approach has a rational basis, the results represent a current and historic perspective on conditions and cannot capture all the nuances of a location's or city's appeal. However, the information highlights competitive conditions that would benefit from additional attention, and it also provides a way of comparing a location's competitive strength in specific clusters with other locations.

Model Results

Figure 2-1 is a map that shows job centers by their competitiveness, as measured by their average match with all industry clusters, both basic and nonbasic. A clear pattern is evident in Figure 2-1: job centers that are more centrally located in the more maturely developed parts of the urban area are the most competitive. The reason for this is because job centers in the more developed areas have strengths in two site factors that are especially important to business: (1) availability of work force and (2) availability of building space and improved sites. This is a powerful combination for local economic development. As the region's population grows, job centers that are currently near the periphery of the urban area will improve their access to work force, and real estate investment will follow once they are in a clear path of development.

³ Proximity to freeways, rail, and airports; presence of business/professional/technical services and intermediate product manufacturers; and building cost and availability

⁴ Number of workers by broad occupational category; Stanford test scores of 8th graders and high school dropout rates; housing values; and educational attainment of persons in workforce.

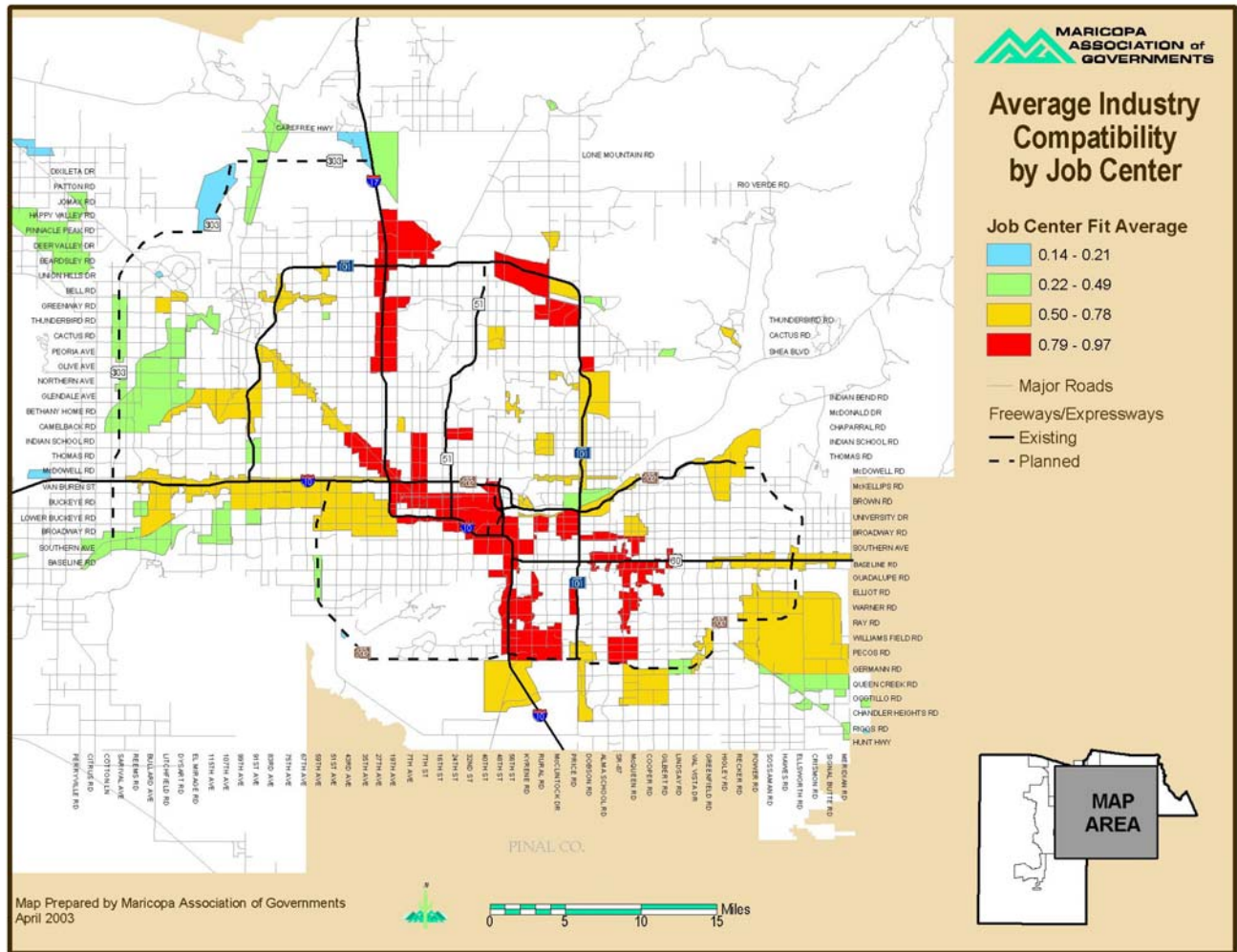


Figure 2-7

Table 2-3 shows the cities that have cluster scores in the top quartile for at least one of their job centers. Of these cities, six have at least one high-ranking job center for every cluster:

- Chandler
- Gilbert
- Mesa
- Phoenix
- Scottsdale
- Tempe

Additionally, Glendale and Peoria are in the “next tier” of high-ranking job centers, while Goodyear and Tolleson each have three centers in the top quartile.⁵

Table 2-3

Cities with Top-Ranking Job Centers (top quartile of score rankings)																
Cities \ clusters	GPEC Priority Clusters					Non-Priority Basic Industry Clusters							Nonbasic Industry Clusters			
	Advanced Business Svc	Aerospace & Aviation	High Tech Electronics	Software	Bioindustry	Optics	Tourism	Trans. Distr & Whlsl Trade	Other Basic Industries	Ag & Food Processing	Other Supplier Ind.	Plastics	Minerals & Fabr. Metals	Growth Clster	Consumer Industries	Health Svcs.
Chandler	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Gilbert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Glendale		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Goodyear	X						X								X	
Mesa	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Paradise Valley							X									
Peoria				X		X		X	X	X	X	X	X		X	X
Phoenix	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Scottsdale	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Tempe	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Tolleson									X	X		X				

⁵ While this result is interesting, it must be emphasized that this particular finding is not necessarily a “definitive” one. The site factor information on job centers and cities prepared for this study, while solid secondary information, is only a start. This type of model can be organized in different ways, which could be based on more comprehensive site factor information.

2.9 Economic Development Strategies

Regional (GPEC) Strategies

The Greater Phoenix Business Leadership Coalition is a collaboration of ten regional business leadership organizations which are committed to collaborate and build a purposeful, meaningful business agenda that would build the Phoenix metropolitan region into an internationally competitive, vital economy.

As part of this mission, the Coalition has formed a Continuous Agenda composed of long and short-term strategies. By late summer 2002, the Steering Committee had honed in on approximately 60 priority strategies, and ranked nine of those issues as first priorities.

The first five of the nine priority items have been adopted by the entire Coalition. Each organization within the Coalition agrees to support these strategies as the issues are moved into the legislative and public arenas. The five priorities include:

- Enhance the competitive position of the state and region in targeted high-wage industries.
- Support an extension of the transportation sales tax.
- Support a competitive analysis of the tax policies of neighboring and competitive states to determine Arizona's competitive position with other states.
- Support the expansion of Phoenix Civic Plaza.
- Preserve and enhance Arizona's key military operations that collectively constitute the military industry in the state.

Of these priorities, enhancing the competitive position of the region in the targeted high-wage industries has become the most urgent. A responsibility of GPEC, the regional economic development strategy is to develop a targeted number of direct jobs in each of the high-wage target clusters:

- Advanced Business Services – 27,700 new jobs by 2010
- Aerospace & Aviation – 12,300 new jobs by 2010
- High Tech Electronics – 20,500 new jobs by 2010
- Software – 32,500 new jobs by 2010
- Bioindustry – 12,900 new jobs by 2010

*Strategy Overview.*⁶ As Greater Phoenix works its way out of the current recession emboldened by greater collaboration among regional organizations, it is confronted with a choice. It can either continue an economic development path that has brought about positive growth, but that has not achieved a full measure of excellence, or it can commit to building on its strengths to make substantive change to move to the next level. A major component of the comprehensive regional economic development strategy is to change the mix of industries in the region so that one out of every six new jobs created over the next ten years is in one of five identified high-wage industries—aerospace and aviation; advanced business services; bioindustry; high-technology manufacturing; and software.

These goals will be accomplished by the regional and local organizations in the Valley involved in economic development working cohesively together to ensure that all activities of business development in the region—attraction, expansion and retention, and new company start-ups—

⁶ The text in this section is taken from GPEC's 11-14-02 BD Pre-reads memo

are aligned with the strategy. Regional priorities do not exclude or replace local or community-specific ones.

As businesses begin to look at the comprehensive “value” a region offers—in addition to its cost competitiveness—Greater Phoenix will need to set itself apart by its overall business, social and economic climate, as well as the expertise of specific strengths in focused industry clusters. A comprehensive regional economic development strategy will help Greater Phoenix build such a case. It will also serve as the “glue” to tie together the various initiatives underway within the Coalition, showing how they all work together to build an internationally competitive, vital, economy that provides continuing opportunities for the region’s residents to live, work and recreate.

Local Strategies

The survey of economic developers conducted in 2002 asked for information about local economic development strategies, and this information was provided primarily through documents that the local practitioners indicated were used to currently guide economic development policy. A wide variety of documents were furnished, from economic development strategic plans to organizational work plans.

The approach to processing this material was, first, to identify as many common themes as required to capture the full range of ideas or tasks presented, and also keep that list as concise as possible. The list thereby generated, containing 27 entries, was then organized under 5 major headings:

- Physical improvements
- Organizational/governmental enhancements
- Workforce needs and attractions
- Economic activity
- Economic activity related to areas

In an attempt to demonstrate the relative attention given to each strategy category, the number of times strategies fell into some particular category was counted as a “mention,” so that a matrix of the 27 line items by city was produced with the number of mentions in each matrix cell. This process was imperfect at best, given the different types of documents and the variations in level of detail, comprehensiveness of the material, etc. The method also required a series of judgment calls about the content of the material reviewed. However, because our focus was on a qualitative rather than quantitative assessment, the method can still produce valid and useable results.

Figure 2-3, a chart of the strategic emphasis, by city, at the level of the 5 major headings, indicates that the focus of strategies varies considerably among cities. Summing all the “mentions” (of the 11 communities that have economic development policy documents), the regional composite has the following local economic development priorities:

- Organizational/governmental enhancements – 24% of mentions
- Economic activity – 23.7% of mentions
- Economic activity related to areas – 19.5% of mentions
- Physical improvements – 16.9% of mentions
- Workforce needs and attractions – 15.9% of mentions

This material should be useful to economic development practitioners as a way of gauging their own program focus in comparison to that of other communities. Differences in program emphasis are to be expected, based on the following as well as other conditions:

- The areas of responsibility assigned to the economic development operation;
- Cities' degree of direct involvement in real estate development, revitalization, etc.; and
- The relative attractiveness of cities for certain industries, compared to the industries that cities are targeting.

Figure 2-8
Strategy Emphasis by Community

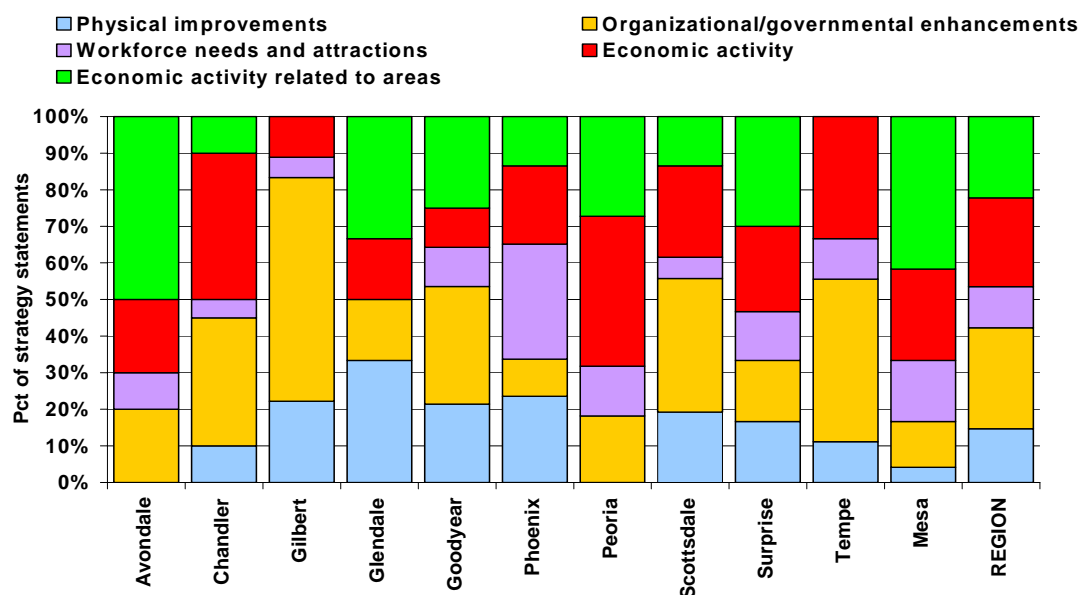


Table 2-4 shows the 27 categories of strategies and supporting policies and the 5 major categories, along with the percent of mentions, for all cities combined, attributed to each. The table demonstrates that overall the cities are addressing economic development in a comprehensive manner. Drilling down beneath the 5 major categories, the top local priorities are:

- Target specific industry cluster or industry type – 12.7% of mentions
- Build up organizational/community responsiveness to economic development process – 11% of mentions
- Coordinate growth areas/industries with community development policies/actions – 10.7% of mentions
- Enhance quality of life – 8.8% of mentions
- Build up physical capacity – 8.4% of mentions
- Revitalize existing areas – 8.1% of mentions
- Focus on citizen job/training needs and income enhancement – 6.8% of mentions
- Promote retention/expansion through outreach and other programs – 5.8% of mentions
- Promote certain areas (including undeveloped) – 4.9% of mentions

- Enhance fiscal strength/stability – 3.9% of mentions
- Leverage/protect existing assets – 3.9% of mentions

For the most part cities' strategies reflect a community-specific rather than regional focus. The strategy area that is shared by regional and local economic development is targeting of industries. Current Business Leadership Coalition strategies also address the regional transportation sales tax, the need for a comparative tax analysis, expansion of the Phoenix Civic Plaza, and support for Luke Air Force Base and other military installations. One city mentioned support for the regional transportation system, one mentioned the need for an improved business climate in the state, the need to protect Luke was included in the category "leverage/protect existing assets," and as a general reference to regional issues, there were two mentions among the cities of the need to cooperate with regional and local allies in economic development.

Table 2-4	No. of Mentions	% of Mentions
Strategy Categories & Supporting Policies Mentioned in Community General Plans or Economic Development Strategies and Plans		
<i>Organizational/governmental enhancements</i>	74	24.0%
Build up organization/community responsiveness to economic development process	34	11.0%
Enhance fiscal strength/stability	12	3.9%
Conduct focused research; develop databases	7	2.3%
Expedite permitting; minimize costs for development	7	2.3%
Develop/apply incentives	4	1.3%
Enhance cluster awareness and general responsiveness	4	1.3%
Encourage new/expanded roles for institutions of higher learning	3	1.0%
Cooperate with regional and local allies	2	0.6%
Encourage positive change in business climate, statewide	1	0.3%
<i>Economic activity</i>	73	23.7%
Target specific cluster or industry types	39	12.7%
Promote retention/expansion through outreach and other programs	18	5.8%
Diversify economy	4	1.3%
Encourage start-up businesses	3	1.0%
Encourage existing industries to update to new/emerging technologies	2	0.6%
Focus on specific land use types	2	0.6%
Increase ratio of jobs per resident	2	0.6%
Promote sustainable economy	2	0.6%
Provide jobs for less urbanized hinterlands	1	0.3%
<i>Economic activity related to areas</i>	60	19.5%
Coordinate growth areas/industries with community development policies/actions	33	10.7%
Promote certain areas (including undeveloped)	15	4.9%
Leverage/protect existing assets	12	3.9%
<i>Physical improvements</i>	52	16.9%
Build up physical capacity	26	8.4%
Revitalize existing areas	25	8.1%
Support development of regional transportation system	1	0.3%
<i>Workforce needs and attractions</i>	49	15.9%
Enhance quality of life	27	8.8%
Focus on citizen job/training needs and income enhancement	21	6.8%
Enhance community image	1	0.3%
Sum of Mentions	308	100.0%

3. JOB CENTERS

Understanding the importance of jobs in the region's economic health and the importance of the geographic concentrations of jobs to the region's physical development, MAG worked with municipal planning and economic development directors to inventory existing and future job centers.

By definition, community job centers are delineated areas at the local level, which are comprised of an identifiable concentration of employment activities and land uses that are entirely, or predominantly, of a non-residential nature. Community job centers consist of concentrated or mixed areas of industrial, office, retail, airport, and government land uses and other job-generating activities.

There are 106 community job centers in Maricopa County. They contained 55% of all County jobs in 2000, and will contain 55% of all County jobs at build-out, according to community general plans (Table 3-1). These are where the future economic base of the region will be located, and it is a critical economic development issue to protect them from conversion to residential development.

**Table 3-1.
Total Jobs**

	Jobs, 2000	Jobs, Build-out
Developed Centers	126,330	157,370
Existing Centers	622,680	1,610,130
Revitalization Centers	45,730	71,800
Future Centers	28,480	858,180
All Centers	702,617	2,697,480
Maricopa County	1,564,800	5,026,500

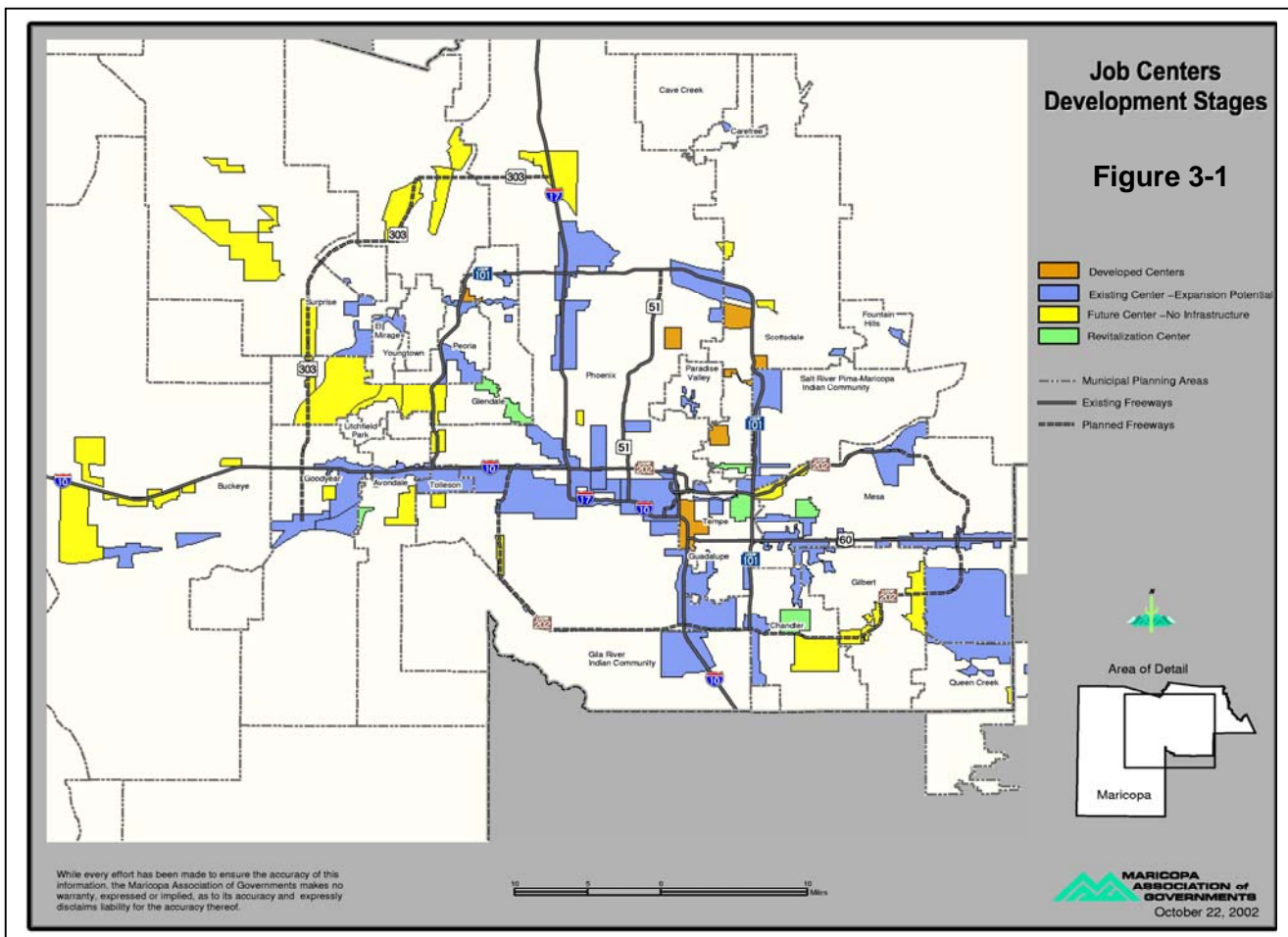
Source: Maricopa Association of Governments

Job Centers by Stage of Development

Job centers are categorized into the following four categories: developed centers, existing centers with expansion potential, future centers without infrastructure, and revitalization centers. Figure 3-1 displays the 106 community job centers according to those development stages.

Developed centers are essentially existing job centers, which are nearly developed and which contain all necessary on-site infrastructure, such as water, sewer, roads, communications and utilities. In 2000, developed centers contained 126,000 jobs, and their build-out capacity is 157,000 jobs.

Existing centers with expansion potential are community job centers that currently have all necessary on-site infrastructure for commercial or industrial expansion, and have considerable available lands for further growth and development. There are 58 existing centers, that contained 623,000 jobs in 2000 and that would contain 1.6 million jobs at build-out.



Revitalization centers are defined as those centers that are the focus of ongoing community redevelopment efforts at the municipal level. Many of these centers are located in established areas of their respective communities, and have been in existence for some time. In 2000, seven revitalization centers contained about 46,000 jobs, and at build-out, they contain nearly 72,000 jobs.

Future centers without infrastructure are community job centers that are planned, but do not yet have existing infrastructure. These areas represent large expanses of available lands with the potential to become major centers of employment for the region's population. There are 34 future centers that contained just fewer than 7,000 jobs in 2000 but that could contain nearly 860,000 jobs at build-out.

Regional Job Centers

Regional job centers are those that contain, or have future capacity to contain, a high number of jobs, enough so that they are not local job centers. Instead, they attract workers from throughout the Metro Phoenix region. Regional job centers are defined to be those that contained higher than the median number of jobs for the year 2000 – effectively, 15,000 jobs or more.

There are 59 regional job centers. They are the principal centers for employment-generating land uses in the region, as they contain the vast majority of jobs in all 106 job centers. Regional

job centers contained 680,000 jobs in 2000 and are planned to have the capacity for nearly 2.4 million jobs at build-out – 43.7 percent of total county jobs in 2000 and 47.3 percent of county jobs at build-out. By comparison, all 106 job centers contained 45 percent of total county jobs in 2000 and 54 percent at build-out.

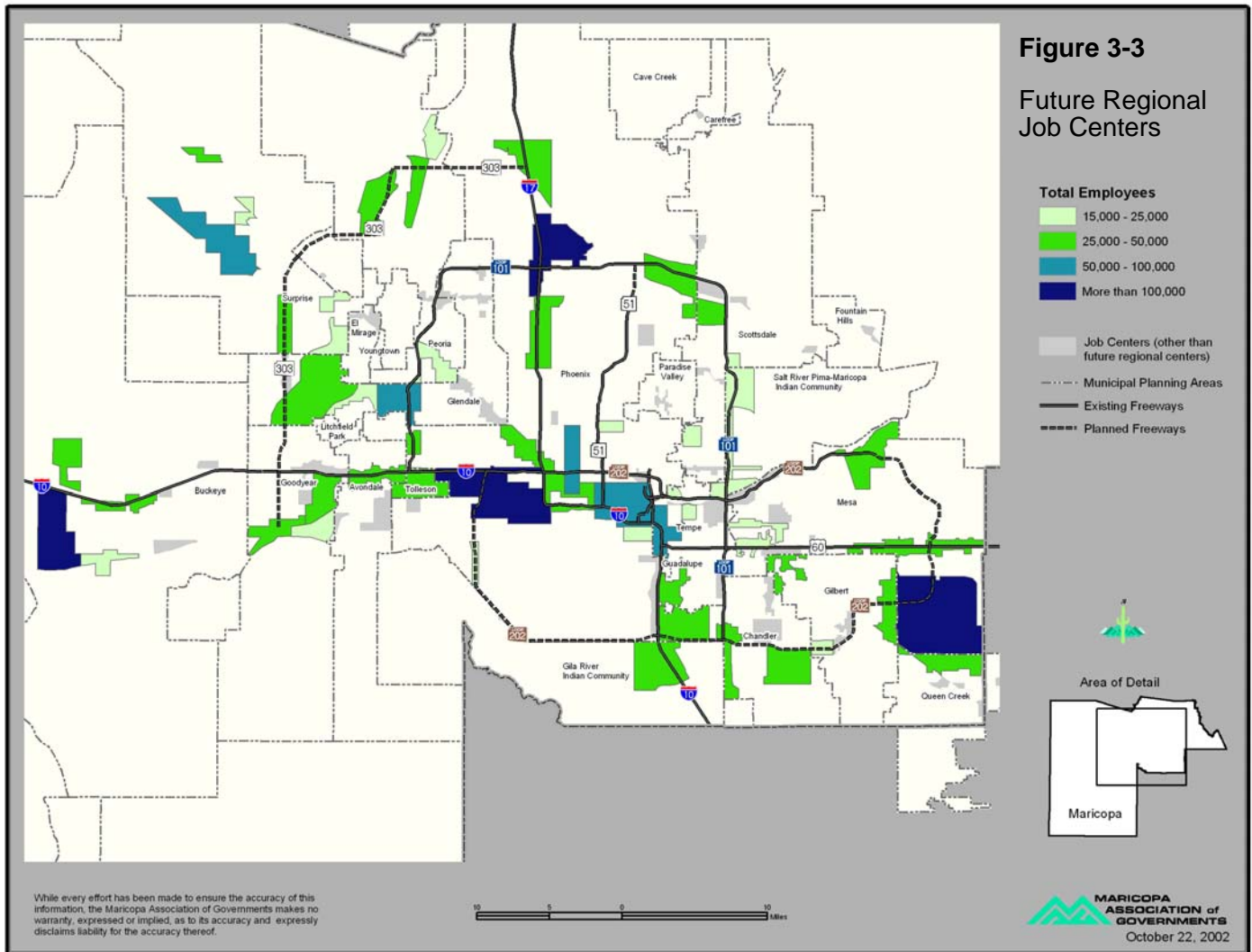
Existing regional job centers, displayed in Figure 3-2, are generally located in the core of the metropolitan area. There are three largest centers (50,000 to 100,000 jobs) that are concentrated in the center of the Metro Phoenix region – Sky Harbor Airport, Northwest Tempe, and North Central Avenue. A second tier (25,000 to 49,999 jobs) consists of seven regional centers, of which four are also located in the center of the region. A third tier (15,000 to 24,999 jobs) consists of seven centers – one in the region's center and the balance in Scottsdale, Tempe, Chandler and Mesa.

The geographic pattern of future regional centers is a dramatic contrast to existing ones (Figure 3-3). At build-out, four very large (over 100,000 jobs) regional centers are planned, and only one is near the center of the region – Southwest Phoenix. The other largest regional centers are near the periphery of the current geographic extent of metropolitan Phoenix – in east Mesa (Williams Gateway), in Buckeye (West Buckeye), and in north Phoenix (Deer Valley).

Generally, rather than a concentration of job centers like the current situation, future planned regional job centers will be distributed more evenly throughout the metropolitan region at build-out. With a build-out population of over 8 million people, the wide dispersion of regional job centers throughout the metropolitan area will likely result in functional sub-regions based on commuting patterns. Instead of cross-region commuting, greater jobs/housing balance in sub-regions is likely to occur.

Figure 3-3

Future Regional Job Centers



Industry Cluster Mix of Job Centers

In 2002, MAG developed a major employer database that covers all employers with five or more jobs. Reviewed by local agency economic development staff, the major employer database contains more than 30,000 businesses that, in total, employ more than 1.2 million jobs – 78 percent of all wage and salary employment in Maricopa County.

Working with the Greater Phoenix Economic Council (GPEC), MAG defined industry clusters as aggregations of specific 4-digit SIC industries; the industry cluster definitions for the major employer database are the same as for county-level wage and salary job information. The 17 industry clusters are grouped into three categories: (1) five GPEC industry cluster targets, which are high-wage clusters; (2) other basic industry clusters, which primarily export goods and services outside the county, or which are primarily suppliers to basic industries; and (3) nonbasic industry clusters, which primarily sell to the local Metro Phoenix market.

The concentration of jobs in each industry cluster was calculated for the 106 job centers, using a statistical technique called location quotient analysis⁷. The location quotient for each industry cluster in a job center is numerically computed by dividing the share of the cluster over total jobs in the center by the share of the cluster divided by total jobs in the county.

As used in this report, location quotients measure the concentration of industry cluster jobs for each job center, relative to the County. A score of 1.0 means a job center has the identical concentration for an industry cluster as does the County; a score greater than 1.0 means a higher concentration in the center.

Concentration of industry clusters in identified job centers is summarized as below:

1. The **advanced business services** cluster had nearly 300,000 jobs in Greater Phoenix in 2000, and it is rapidly growing. The highest concentrations of advanced business services, a high wage cluster, are located in job centers in the urban core, in Phoenix.
2. **High tech electronics** included 60,000 jobs in 2000. Expansion of research and development portions of high-tech is included in the region's economic development strategy. The greatest concentrations of high tech electronics are found in three areas: the urban core of Phoenix and Tempe; southeast valley, (Chandler, Gilbert, Mesa), and the north/northeast parts of the region (Phoenix and Scottsdale).
3. The **aviation and aerospace** cluster is widely dispersed across the region, located in job centers that have airports and industrially zoned land. Despite having shrunk to 55,000 jobs in 2000, the long term prospects for this cluster are considered good.
4. The rapidly growing **software** cluster had 29,000 jobs in 2000 with highest concentrations located in job centers proximate to high-end housing in Scottsdale, Phoenix, Tempe and Chandler.
5. The **bioindustry** cluster is relatively small with less than 9,000 jobs in 2000 with projections for rapid growth, consistent with national trends. The cluster is widely dispersed; above average concentrations are found in Surprise, Peoria, Glendale, Goodyear, Phoenix, Scottsdale, Tempe, Chandler, and Mesa.
6. **Tourism**, while a low-wage industry, is one of the economic backbones of the region with 160,000 jobs in 2000. The most widely dispersed of the clusters, concentrations are found in retail-oriented job centers.
7. In 2000 the **transportation, distribution and wholesale trade** cluster had 105,000 jobs. The highest concentrations are found in job centers across the region near freeways and airports.
8. **Supplier industry** jobs are concentrated in the center of the region in a north-south belt including Glendale, Phoenix, Scottsdale, Tempe, Chandler and Gilbert. The cluster employed 28,000 in 2000.
9. **Agricultural and food processing** is a cluster split between commodities for export and those that feed the region with 20,000 jobs in 2000. Concentrations are generally located near agricultural areas in the west valley.
10. **Mining and metals** includes 5,600 jobs and is considered a small, low-growth cluster. Job centers with the highest and above average concentrations are in Glendale, Tolleson, Phoenix, Scottsdale, Tempe, Mesa, and the Gila River Indian Community.

⁷ The location quotient for each industry cluster in a job center is numerically computed by dividing the share of the cluster over total jobs in the center by the share of the cluster divided by total jobs in the county.

11. **Plastics**, another small industry cluster, had 5,600 jobs in 2000 with exceptionally high expansion potential. The greatest concentrations are along the freeways, primarily in job centers with industrially zoned land.
12. The **other basic industry** cluster includes all manufacturing not included in other clusters. With a good outlook for expansion, 36,000 jobs were in this cluster in 2000. Concentrations are found in job centers with industrial zoning located along freeway corridors.
13. The **Growth Industry** cluster is one of the region's largest with nearly 200,000 jobs in 2000. This cluster is widely dispersed across the with higher concentrations in newly urbanizing areas including Surprise, El Mirage, Glendale, Goodyear, Chandler, Gilbert, and Queen Creek.
14. **Consumer Industries** are purely a non-basic cluster, marketing the region's population with 250,000 jobs. Geographically dispersed, the cluster primarily locates in retail zoned job centers.
15. Job creation is expected to be strong and grow from the current 90,000 jobs in the **Health Services** cluster. Widely dispersed at regional and sub-regional medical/hospital centers, highest concentrations are found in Surprise, Scottsdale, Mesa, and Chandler.
16. **Education** employed 14,500 jobs in 2000 and is dependent on population and household demand. Jobs are dispersed across the region, primarily where higher education facilities are located.
17. **Government** included 180,000 jobs in 2000. This cluster is dispersed across the region, mainly in regional and city centers.

4. Projected Growth & Development

This chapter presents projections of future economic and demographic growth in the Greater Phoenix Region based on the MAG Interim projections as of June 2003 for Maricopa County, and on MAG's "placeholder" projections as of May 2003 for Pinal County.

This chapter is organized in two sections. Section 4.1 describes the regional projections and trends for Greater Phoenix. The projected economy is described, including gross regional product, output and jobs for 17 industry clusters, and personal income. Section 4.2 provides description and analysis of projections for population and employment distribution within the MAG Region.

4.1 Greater Phoenix

According to Census 2000, the Greater Phoenix Region accounts for greater than sixty-percent of population in the State of Arizona. Since the mid-1970's, the predominant type of development in the region has been Master Planned Developments (MPD's). As Figure 4-1 shows, proposed, planned and active MPD's are located at the edge of the metropolitan region. There are three main directions of growth of MPD's – north and west in Maricopa County, and south and east, largely in Pinal County.

In 2000, there were approximately 400 MPD's in Maricopa County, with a build out capacity of approximately 500,000 dwelling units. In northern Pinal County – defined with a southern boundary of Casa Grande and Eloy – there are approximately 131 large development projects, with a build out capacity of more than 230,000 dwelling units. The development projects in Pinal County are predominately residential, with very little industrial and commercial land uses. Thus, it is anticipated that a considerable amount of commuting by the Pinal County workforce to jobs located in Maricopa County could take place. Based on current land plans, socioeconomic projections indicate that Maricopa County has, and will maintain, the bulk of economic activity, while Pinal County is likely to be primarily a residential suburb.

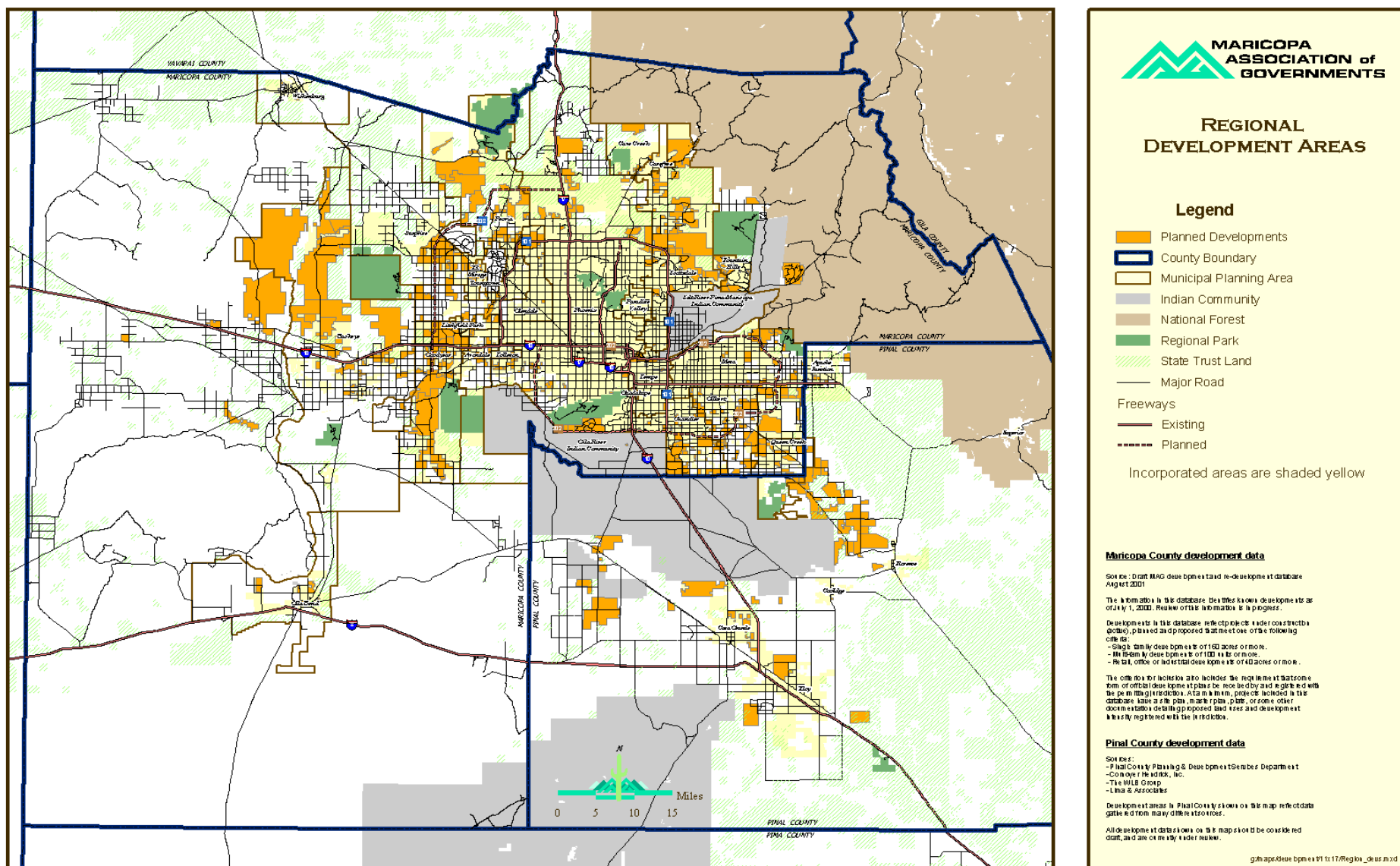


Figure 4-1: Planned Developments in Greater Phoenix Region

4.1.1 Economy

The Gross Regional Product (GRP) for the two-county region is projected to increase 244% between 2000 and 2030, from \$170 billion to \$587 billion in fixed 1996 dollars (Table 4-1).

Table 4-1: Gross Regional Product by Demand Components
Greater Phoenix Region, 2000-2035

(Bil. Fixed 1996\$)

	2000	2005	2010	2015	2020	2025	2030
Gross Regional Product	\$ 170.0	\$ 207.2	\$ 261.1	\$ 321.9	\$ 394.6	\$ 478.9	\$ 586.4
Consumption	\$ 70.4	\$ 88.9	\$ 113.0	\$ 140.2	\$ 171.3	\$ 205.8	\$ 248.1
Imports	\$ 55.4	\$ 69.0	\$ 90.3	\$ 115.4	\$ 146.1	\$ 183.0	\$ 232.1
Exports	\$ 57.5	\$ 68.1	\$ 87.6	\$ 108.3	\$ 133.6	\$ 162.3	\$ 197.7
Fixed Investment	\$ 28.5	\$ 32.8	\$ 40.2	\$ 50.2	\$ 63.4	\$ 81.4	\$ 107.8
Government	\$ 13.7	\$ 17.4	\$ 20.3	\$ 23.2	\$ 26.3	\$ 29.5	\$ 32.7
Net Exports	\$ 2.0	\$ (0.9)	\$ (2.7)	\$ (7.1)	\$ (12.5)	\$ (20.7)	\$ (34.4)

Source: Maricopa Association of Governments & Regional Economic Models, Inc.

Like other metropolitan regions, the area has an open economy, with considerable trade flows between exports and imports. Looking at the demand components of GRP for 2000 (Table 4-1), local consumption is the largest component, but exports are a close second, followed by substantial imports, significant fixed investment, and modest government purchases.

A comparison between the region and nation (Table 4-2) clearly shows the open economy of two-county region. Personal consumption in the region is a substantially lower share than in the U.S., while both exports and imports are much higher shares in the region. Fixed investment, though its growth rate is faster than GRP, is a smaller share of the region's GRP than of the nation's GNP. The share of government purchases is currently much lower in the region than in the nation but is expected to be approximately the same as the nation by 2030.

Table 4-2: Gross Product by Demand Component
Greater Phoenix and United States, 2000, 2015 and 2030
(Percent of Gross Product)

	2000		2015		2030	
	Phoenix	US	Phoenix	US	Phoenix	US
Gross Regional Product	100%	100%	100%	100%	100%	100%
Consumption	41%	68%	43%	59%	42%	47%
Imports	32%	16%	36%	19%	40%	24%
Exports	34%	20%	34%	15%	34%	18%
Fixed Investment	17%	20%	16%	19%	18%	18%
Government	8%	17%	7%	11%	6%	7%
Net Exports	1%	-5%	-2%	3%	-5%	12%

Source: Maricopa Association of Governments & Regional Economic Models, Inc.

An important characteristic of Greater Phoenix's economy is that the region will import more than it exports. The reason for high imports is to meet local demand, both consumer expenditures and intermediate product demand by the region's industry. As Table 4-3 shows, with increased size, self-supply is projected to be a smaller share of local demand, with imports increasing from 28% of local demand in the year 2000 to 34% in the year 2030.

Table 4-3: Sources for Meeting Local Demand
Greater Phoenix, 1980-2035
(Bil. Fixed 1996\$)

	Demand	Imports	Self Supply	Self Supply Share
1980	\$ 53.4	\$ 14.7	\$ 38.7	72%
1985	\$ 78.5	\$ 22.1	\$ 56.4	72%
1990	\$ 86.2	\$ 21.4	\$ 64.8	75%
1995	\$ 113.0	\$ 29.8	\$ 83.2	74%
2000	\$ 172.6	\$ 48.7	\$ 124.0	72%
2005	\$ 196.8	\$ 54.2	\$ 140.8	72%
2010	\$ 236.6	\$ 68.0	\$ 165.9	70%
2015	\$ 285.3	\$ 84.4	\$ 197.4	69%
2020	\$ 343.8	\$ 105.3	\$ 234.0	68%
2025	\$ 415.0	\$ 133.0	\$ 276.3	67%
2030	\$ 508.6	\$ 172.7	\$ 328.6	65%
2035	\$ 632.8	\$ 229.8	\$ 393.6	62%

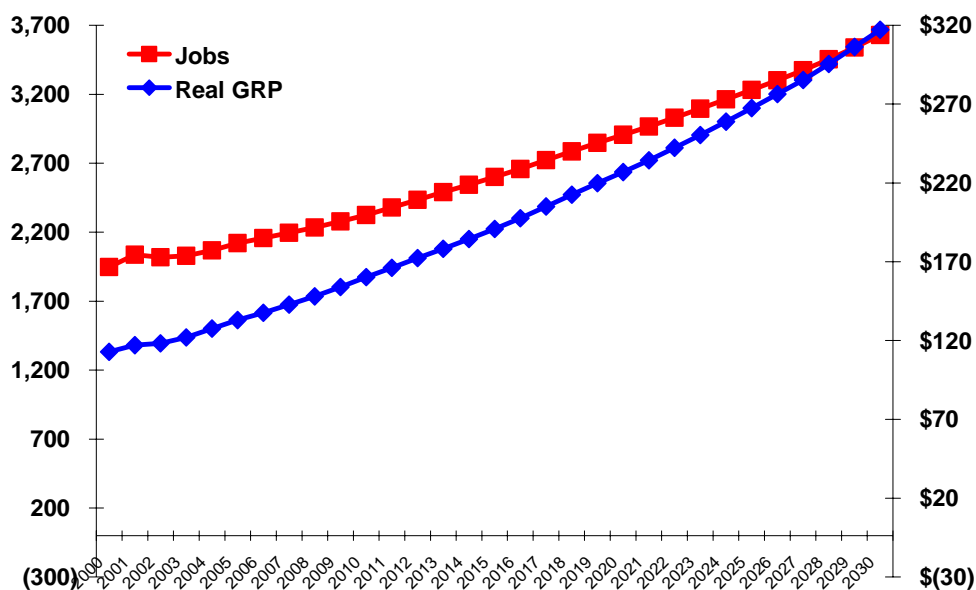
Source: Maricopa Association of Governments and Regional Economic Models, Inc.

This mirrors the nation's outlook for rapid growth of imports and exports – over the 30-year period, US imports are projected to grow 470%, and exports are projected to grow 516%. Exports in the region are projected to grow 244% -- the same rate as overall GRP – while imports are projected to grow 319%, the fastest of any GRP component. Growth rates of other GRP components: fixed investment (278%), personal consumption (252%), and government purchases (140%).

Figure 4-2 shows projected real GRP and total jobs in the region. Real GRP is projected to grow faster than total jobs, from \$113 billion in 2000 to \$317 in 2030. Total jobs – which includes all wage and salary jobs, both full and part time, plus partners and proprietors – is projected to increase from 1.7 million in 2000 to 3.6 million in 2030.

Figure 4-2: Real Gross Regional Product & Total Jobs

Greater Phoenix, 2000-2030



Source: Maricopa Association of Governments & Regional Economic Models, Inc.

Due to technology change and labor productivity, many industries are projected to have a greater increase in output than in jobs. Table 4-4 shows output projections for 17 industry clusters that comprehensively include all industries in the region's economy.⁸ Overall, total output in the region's economy is projected to increase from \$190 billion to \$560 billion from 2000 to 2030, in constant 1996 dollars.

By industry cluster, the Growth Cluster and Advanced Business Services are projected to have the largest output -- \$103 billion (in real dollars) each by 2030. These two clusters alone are projected to account for 37% of total economic output in the region. A second tier of clusters includes High Tech Electronics (\$68 billion in real dollars in 2030), Consumer Industries (\$65 billion), and Transportation & Distribution (\$52 billion). The top five industry clusters are projected to account for 70% of total economic output in the region.

A third tier of clusters includes Other Basic Industry (\$29 billion in 2030), Aerospace & Aviation (\$24 billion), Tourism (\$23 billion) and Government (\$21 billion). A fourth tier includes Software (\$17 billion), Health Services (\$16 billion) and Supplier Industries (\$15 billion). Trailing clusters

⁸ The definition of industry clusters is made from a Standard Industrial Classification basis. Industry cluster definitions are those made by the Greater Phoenix Economic Council for its regional economic development strategy.

in 2030 are Agriculture & Food Processing (\$9 billion), Minerals & Metals (\$5 billion), Bioindustry (\$4 billion), Plastics (\$3 billion) and Educational Services (\$2 billion).

In terms of growth rate (Table 4-4), in both the 2000 to 2015 period and again in the 2015 to 2030 period, overall output is projected to increase 71% to 72%. In the earlier period, industry clusters growing substantially faster than the regional average include Software (139%), High Tech Electronics (112%), Bioindustry (85%), and Tourism (81%). In the later period, the growth leaders are Software (98%), Transportation & Distribution (91%), Aerospace & Aviation (87%), Advanced Business Services (79%), and High Tech Electronics (80%).

Table 4-4: Output by Industry Cluster

Greater Phoenix, 2000, 2015 & 2030

(Bil. Fixed 1996\$)

Industry Cluster	Output			Growth Rate		Percent of Total		
	2000	2015	2030	2000-15	2016-30	2000	2015	2030
Growth Cluster	\$ 41.0	\$ 64.5	\$ 103.7	57%	61%	21.6%	19.8%	18.6%
Advanced Business Services	\$ 33.6	\$ 57.7	\$ 103.2	72%	79%	17.7%	17.7%	18.5%
High Tech Electronics	\$ 18.0	\$ 38.1	\$ 68.4	112%	80%	9.5%	11.7%	12.2%
Consumer Inds.	\$ 21.8	\$ 37.8	\$ 65.1	73%	72%	11.5%	11.6%	11.7%
Transportation & Distribution	\$ 15.6	\$ 27.1	\$ 51.7	74%	91%	8.2%	8.3%	9.3%
Other Basic Industry	\$ 9.5	\$ 16.2	\$ 28.6	71%	77%	5.0%	5.0%	5.1%
Aerospace & Aviation	\$ 8.5	\$ 12.6	\$ 23.5	48%	87%	4.5%	3.9%	4.2%
Tourism	\$ 8.0	\$ 14.5	\$ 22.6	81%	56%	4.2%	4.5%	4.0%
Government	\$ 9.3	\$ 14.5	\$ 20.6	56%	42%	4.9%	4.5%	3.7%
Software	\$ 3.6	\$ 8.6	\$ 17.0	139%	98%	1.9%	2.6%	3.0%
Health Services	\$ 6.9	\$ 10.2	\$ 16.4	48%	61%	3.6%	3.1%	2.9%
Supplier Inds.	\$ 5.0	\$ 8.6	\$ 15.2	72%	77%	2.6%	2.6%	2.7%
Ag & Food Processing	\$ 3.6	\$ 5.9	\$ 8.9	64%	51%	1.9%	1.8%	1.6%
Minerals & Mining	\$ 2.4	\$ 3.4	\$ 4.5	42%	32%	1.3%	1.0%	0.8%
Bioindustry	\$ 1.3	\$ 2.4	\$ 4.3	85%	79%	0.7%	0.7%	0.8%
Plastics	\$ 1.0	\$ 1.6	\$ 2.7	60%	69%	0.5%	0.5%	0.5%
Educational Services	\$ 0.8	\$ 1.2	\$ 2.2	50%	83%	0.4%	0.4%	0.4%
All Industry Clusters	\$ 189.8	\$ 325.1	\$ 558.6	71%	72%	100%	100%	100%

Source: Maricopa Association of Governments & Regional Economic Models, Inc.

Due to labor productivity by industry cluster, the picture for jobs is quite different from that of output (Table 4-5). Advanced Business Services dominates the job picture, with a projection of 921,000 jobs by 2030 – 25% of all jobs in the region. A second tier includes Other Basic Industry⁹ (543,000 jobs in 2030) and Government (433,000 jobs). Together, these three clusters are projected to contain over 52% of the region's total jobs in 2030.

⁹ This cluster is entirely composed of manufacturing industries that are not included in other industry clusters.

Table 4-5: Jobs by Industry Cluster
Greater Phoenix, 2000, 2015 & 2030

Industry Cluster	Jobs (000's)			Growth Rate (%)		Percent of Total (%)		
	2000	2015	2030	2000-15	2015-30	2000	2015	2030
Advanced Business Services	344.5	555.0	921.5	61%	66%	20.2%	22.4%	25.4%
Other Basic Industry	312.0	406.0	542.9	30%	34%	18.3%	16.4%	15.0%
Government	181.7	309.9	433.1	71%	40%	10.7%	12.5%	11.9%
Health Services	92.4	177.1	324.2	92%	83%	5.4%	7.1%	8.9%
Tourism	156.7	217.4	285.4	39%	31%	9.2%	8.8%	7.9%
Consumer Inds.	127.8	184.3	251.9	44%	37%	7.5%	7.4%	6.9%
Growth Cluster	148.7	175.8	223.5	18%	27%	8.7%	7.1%	6.2%
Transportation & Distribution	114.7	133.2	167.9	16%	26%	6.7%	5.4%	4.6%
Aerospace & Aviation	46.9	65.5	104.7	40%	60%	2.8%	2.6%	2.9%
Supplier Inds.	45.3	62.9	87.2	39%	39%	2.7%	2.5%	2.4%
Software	25.1	52.0	86.8	107%	67%	1.5%	2.1%	2.4%
Ag & Food Processing	30.6	49.6	82.7	62%	67%	1.8%	2.0%	2.3%
Educational Services	19.8	33.7	61.1	70%	81%	1.2%	1.4%	1.7%
High Tech Electronics	42.4	37.8	35.9	-11%	-5%	2.5%	1.5%	1.0%
Bioindustry	3.7	5.6	8.4	53%	50%	0.2%	0.2%	0.2%
Minerals & Metals	6.4	6.8	6.4	7%	-6%	0.4%	0.3%	0.2%
Plastics	4.1	4.7	5.6	14%	19%	0.2%	0.2%	0.2%
All Industry Clusters	1,702.8	2,477.3	3,629.3	45%	47%	100%	100.0%	100.0%

Source: Maricopa Association of Governments & Regional Economic Models, Inc.

A third tier of industry clusters includes Health Services (324,000 jobs in 2030), Tourism (285,000 jobs), Consumer Industries (252,000 jobs), the Growth Cluster (224,000 jobs), and Transportation & Distribution (168,000 jobs). The top three tiers are projected to account for over 86% of all jobs in the region in 2030.

A fourth tier includes Aerospace & Aviation (105,000 jobs in 2030), Supplier Industries (87,000 jobs), Software (87,000 jobs), Agriculture & Food Processing (83,000 jobs), and Educational Services (61,000 jobs). High Tech Electronics is projected to have a declining number of jobs, going from 42,000 jobs in 2000 to 36,000 in 2030. This is entirely due to labor productivity increase, as the cluster's production output is projected to grow, in real 1996 dollars, from \$18 billion in 2000 to \$68 billion in 2030 (Table 4-4).

Overall, total jobs in Greater Phoenix are projected to increase by 45% in the 2000-2015 period and by 47% in the 2015-2030 period. In the earlier period, clusters with substantially higher growth rates include Software, Health Services, Government, Educational Services, Agriculture & Food Processing, and Advanced Business Services. In the later period, the leaders are Health Services, Educational Services, Software, Agriculture & Food Processing, Advanced Business Services, Aerospace & Aviation, and Bioindustry.

Table 4-6 shows total personal income by component. There are five striking characteristics of the projection:

- First, the growth rate of wage & salary disbursements is higher than projected jobs, but lower than projected output. This makes sense, since greater labor productivity should translate into higher wages.
- Second, and related to the previous point, real personal per capita income is projected to increase from \$27,340 (in constant 1996 dollars) to \$29,750 in 2015 and to \$39,870 in 2030.
- Third, transfer payments are projected to increase at a growth rate that is approximately twice that of total personal income. This is due in large part to the greater share of retired persons in projected population. Thus, as a share of total personal income, transfer payments increase from 10.7% in 2000 to 16.4% in 2015 and to 22.9% in 2030.
- Fourth, proprietors & other labor income is projected to increase at a growth rate of 73% in both the 2000-15 and the 2015-30 periods, compared to 59% and 66%, respectively, for wage & salary disbursements. This indicates the greater importance of entrepreneurship to the region's economy.
- Fifth, there is a negative residency adjustment, which means that persons living outside Greater Phoenix – are commuting to jobs located inside the region. This residency adjustment is for persons living in Yavapai or Pima County who work in the two-county region.

Table 4-6: Total Personal Income by Component
Greater Phoenix, 2000, 2015 & 2030

Personal Income Component	Bil. Fixed 1996\$			Growth Rate		Percent of Total		
	2000	2015	2030	2000-15	2016-30	2000	2015	2030
Wage & Salary Disbursements	\$ 56.97	\$ 90.69	\$ 150.62	59%	66%	64%	56%	51%
Proprietors & Other Labor Income	\$ 11.72	\$ 20.33	\$ 35.22	73%	73%	13%	12%	12%
Labor & Proprietors Income	\$ 68.69	\$ 111.01	\$ 185.85	62%	67%	77%	68%	63%
Social Insurance Contribution	\$ 4.27	\$ 7.08	\$ 11.70	66%	65%	5%	4%	4%
Net Residency Adjustment	\$ (0.06)	\$ (0.48)	\$ (1.05)	700%	119%	0%	0%	0%
Dividends, Interest & Rent	\$ 15.58	\$ 32.64	\$ 53.83	109%	65%	17%	20%	18%
Transfer Payments	\$ 9.63	\$ 26.65	\$ 67.33	177%	153%	11%	16%	23%
Total Personal Income	\$ 89.57	\$ 162.75	\$ 294.25	82%	81%	100%	100%	100%
Real Personal Income per Capita (000 Fixed 96\$)	\$ 27.34	\$ 29.75	\$ 39.87	9%	34%			

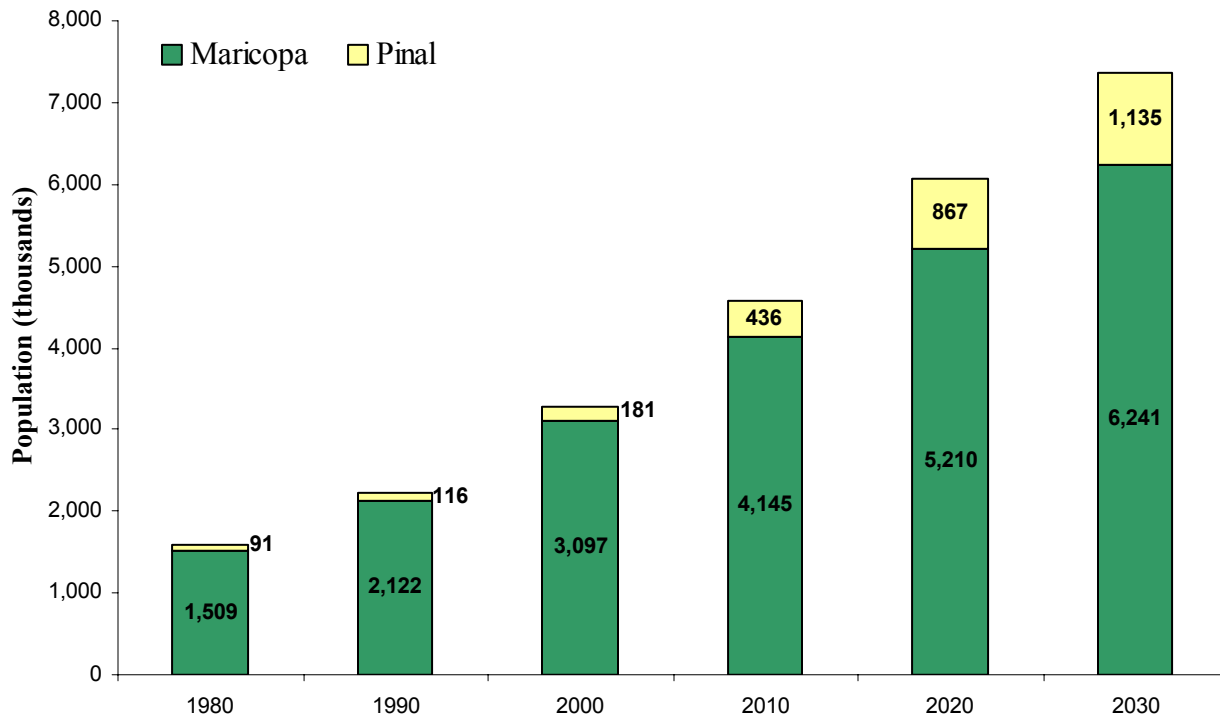
Source: Maricopa Association of Governments & Regional Economic Models, Inc.

4.1.2 Population

Overall population projections for Greater Phoenix follow long-term historical trends (Figure 4-3).

- The region has grown from approximately 1.6 million persons in 1980 to 3.3 million in 2000. It is projected to grow to 4.6 million by 2010, 6 million by 2020, and 7.4 million by 2030.
- Maricopa County has grown from 1.5 million persons in 1980 to nearly 3.1 million in 2000. It is projected to increase to 4.1 million in 2010, 5.2 million by 2020, and 6.2 million in 2030.
- Pinal County has doubled in size from 1980 to 2000, going from approximately 90,000 persons to 181,000 persons. With more than 130 land development projects that have a planned capacity of more than 230,000 dwelling units, Pinal County's population is projected to increase to 436,000 persons in 2010, 866,000 persons by 2020, and 1.1 million by 2030.

**Figure 4-3: Total Population
Greater Phoenix (1980-2030)**

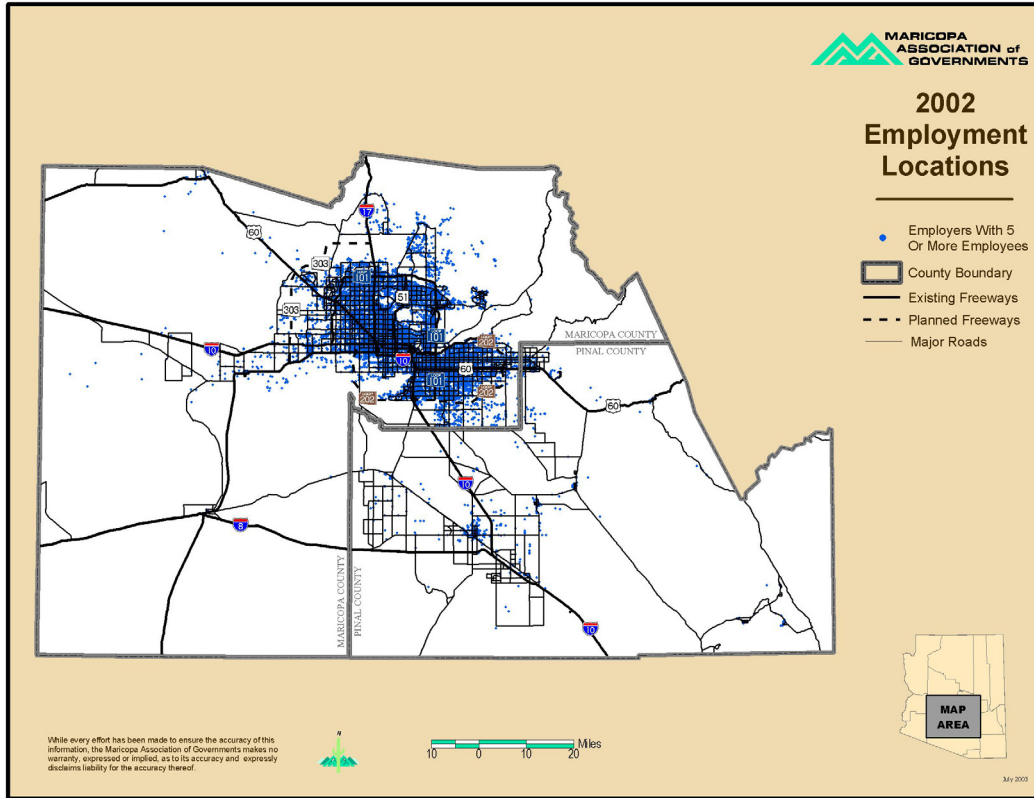


Source: Arizona Department of Economic Security,
Maricopa Association of Governments, Regional Economic Models Inc.

Land development in Pinal County primarily consists of residential projects, and population growth there largely depends on jobs located in Maricopa County. This is clearly demonstrated in Figure 4-4, which shows the existing distribution of employers with more than 5 employees.

- Pinal County's peak was 0.39 jobs/capita in 1974, and it has fluctuated around a long-term declining trend, dropping to 0.28 jobs/capita in 2000. The projection is for a continued decrease to a low of 0.21 in 2025, and increasing to 0.23 by the year 2030.
- By contrast, Maricopa County's history is an increasing ratio, going from 0.43 jobs/capita in 1969 to 0.51 in 2001. Over the future period, Maricopa County's ratio is projected to increase slowly to 0.54 jobs/capita by 2030.
- Overall, the region had a ratio of 0.52 jobs/capita in 2001, which is projected to decline to 0.49 jobs/capita by 2030.

Figure 4-4: Employers in Greater Phoenix



Source: Maricopa Association of Governments Employment Database

One of the most significant characteristics of the projection is the increase in the “dependency ratio” – the proportion of the population that does not work full time compared to the population that is employed. As Table 6-7 shows, although all age groups are projected to grow substantially over the future period, the populations under 14 years, 15-24 years, and 65 years and over are projected to grow much more rapidly, in every ten-year future period. Consequently, share of persons 25 to 64 years – the prime working age group – is projected to fall from 51% in 2000 to 48% in 2010, 46% in 2020, and 43% by 2030.

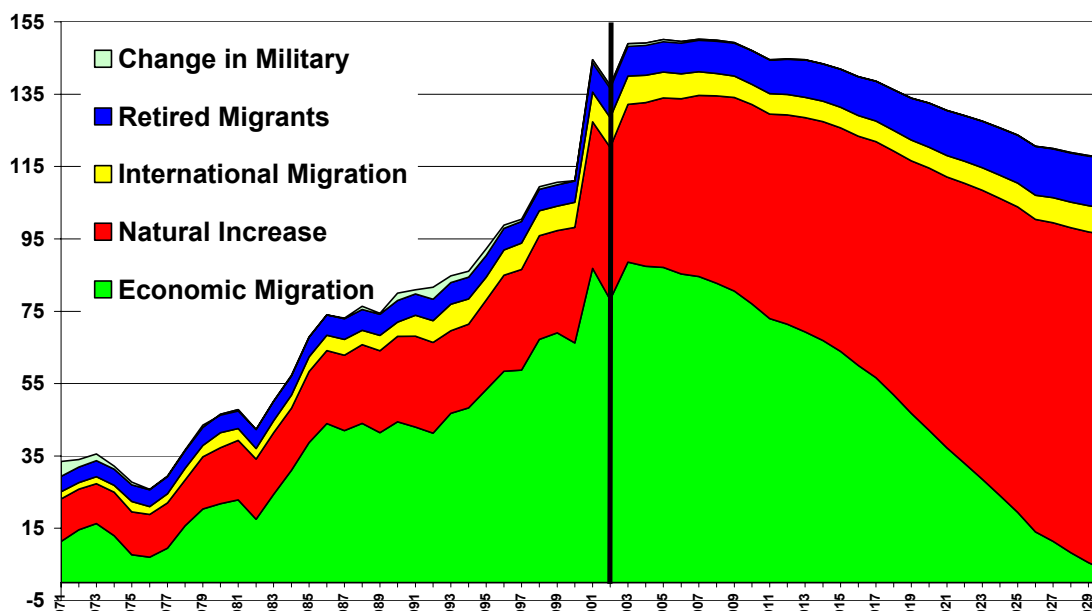
**Table 4-7: Population by Age Group
Greater Phoenix (2000-2030)**

Share of Total Population				
	2000	2010	2020	2030
Ages 0 - 14	23%	26%	26%	26%
Ages 15 - 24	14%	12%	15%	15%
Ages 25 - 64	51%	48%	46%	43%
Ages 65+	12%	12%	14%	16%
Growth Rate				
		2000-10	2010-20	2020-30
Ages 0 - 14		66%	30%	20%
Ages 15 - 24		37%	40%	22%
Ages 25 - 64		39%	22%	14%
Ages 65+		45%	49%	39%
Total		39%	32%	21%

Source: Maricopa Association of Governments & Regional Economic Models, Inc.

A very significant characteristic of the projection is population change and its components (Figure 4-5).

**Figure 4-5: Components of Population Change (1000 persons)
Greater Phoenix (1971-2030)**

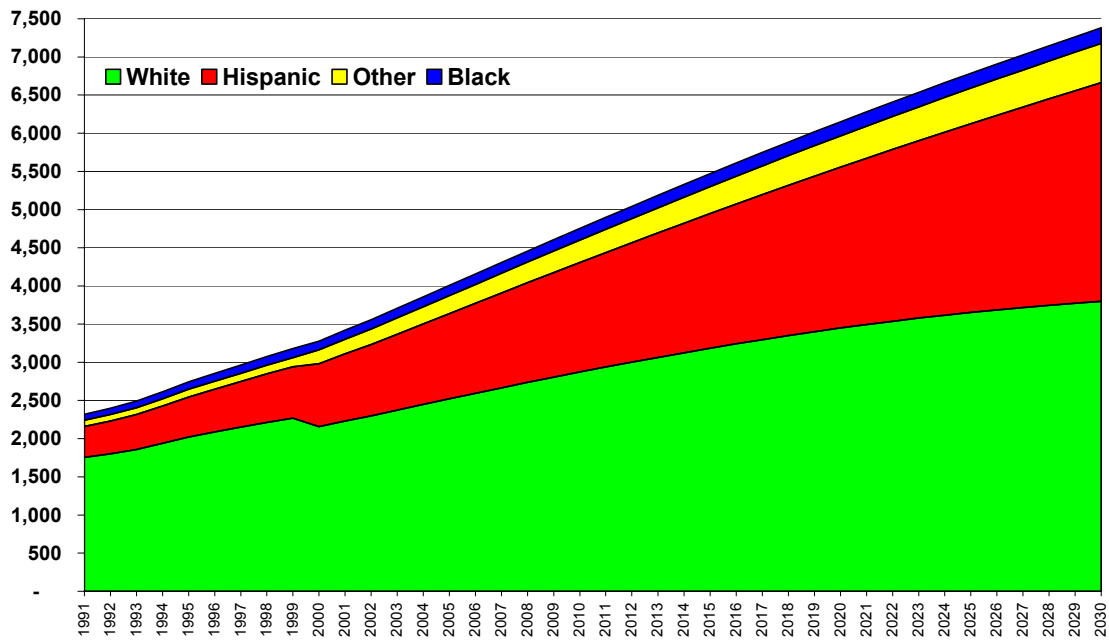


Source: Maricopa Association of Governments & Regional Economic Models, Inc.

Historically, the majority of population change has arisen from economic migration – the prime working age population and their dependents. The projection indicates a shift from economic migration to natural increase. Economic migration is overtaken by natural increase by 2015, and decreases afterwards. Natural increase, on the other hand, is projected to grow from 33,000 annually in 2000 to 55,000 in 2010, 72,000 in 2020, and 92,000 in 2030. The fact that the region’s population growth arises from births in such large numbers indicates that population growth will not slow in the foreseeable future.

One of the major long-term demographic trends in both the nation and in the region is the growth of the Hispanic population (Figure 4-6). Hispanic population in the region is projected to grow from 0.8 million in 2000 to 1.4 million in 2010, 2.1 million in 2020, and 2.8 million in 2030. As a share of total population, Hispanics are projected to increase from 25% in 2000 to 39% in 2030.

**Figure 4-6: Population by Ethnic and Racial Groups (1000 persons)
Greater Phoenix (1991-2030)**



Source: Maricopa Association of Governments & Regional Economic Models, Inc.

4.2 MAG Region Projections

The development of population and socioeconomic projections requires the collection of a substantial amount of base data. These base data include, but are not limited to the following:

- Population and Housing: Census 2000 SF1 data.
- Group Quarters (Institutional and Non-Institutional): Census 2000 SF1 data.
- Employment: Employment July 1, 2000 Base.
- Residential Completions: April 1, 2000 to June 30, 2000, submitted and reviewed by MAG member agencies.
- Residential Completions: July 1, 2000 December 31, 2002, submitted and reviewed by MAG member agencies.
- Street Network: MAGNet is an electronic street network for Maricopa County and Apache Junction that is updated regularly based on the Residential Completions, reviewed by MAG POPTAC.
- Existing Land use: Year 2000 land use current as of July 2000, reviewed by MAG Population Technical Advisory Committee (POPTAC).
- Future Plans: Future Plans current as of 2003, reviewed by MAG POPTAC.
- Development Data: Year 2000 data current as of July 2000, reviewed by MAG POPTAC.
- SAZ system: SAZi03.
- TAZ system: TAZi03.
- Post High School Institutions: MAG GIS & Database Enhancement Project, July 2000.
- Mobile home and RV Parks: MAG GIS & Database Enhancement Project, July 2000.
- Airport 2000 and projected enplanements: Regional Aviation System Plan Update.
- Retirement Areas: MAG GIS & Database Enhancement Project, July 2000.
- Hotels/Motels/Resorts: MAG GIS & Database Enhancement Project, July 2000.

Census Data

Figure 4-7 shows the population density by Census Tract derived from the Census. Figures 4-8 and 4-9 show the vacancy rates and persons per household respectively.

Employment Database

Using the 2000 Maricopa County employment control total, 2000 subregional employment estimates were prepared. An employer database for Maricopa County containing approximately 37,000 employers was purchased from Dunn & Bradstreet. This database was merged with other sources of employment data, especially Maricopa County Trip Reduction Plan data, verified through a telephone survey of the largest employers, subjected to quality control measures and reviewed by MAG member agencies and economic development agencies.

Figure 4-10 shows the distribution of employment locations and the number of employees at each site.

Existing Land Use

The Existing Land Use database identifies the current land use pattern in the urban area. MAG maintains a 49 land use category classification that was established by MAG in concert with its member agencies prior to this data collection effort.

The Existing Land Use database was digitized by MAG staff and MAG consultants based on input from MAG member agencies and then circulated to the agencies for review and verification. Changes were made based on comments provided. Figure 4-11 depicts the Existing Land Use derived from this process.

Future Land Use

The Future Land Use Database is based upon the plans of MAG member agencies and identifies both the type of development that is anticipated to occur in the future and the density of that development. For example, rural residential land use allows for up to 1 unit per acre. In those areas designated rural residential, a maximum is established so that the projections model does not exceed the 1 unit per acre density authorized.

The Future Plan Land Use database also uses the standard MAG 49 land use categories that allows for a direct comparison between existing and planned land use. The difference between the existing and planned land use databases helps determine where development may take place. Figure 4-12 depicts the Future Land Use derived from this process.

Large Scale Developments

A Large Scale Development Database was developed through a consultant study. The Large Scale Development Database was used to calibrate the MAG projections model to ensure that it captured anticipated development. Figure 4-13 depicts the developments derived from this process.

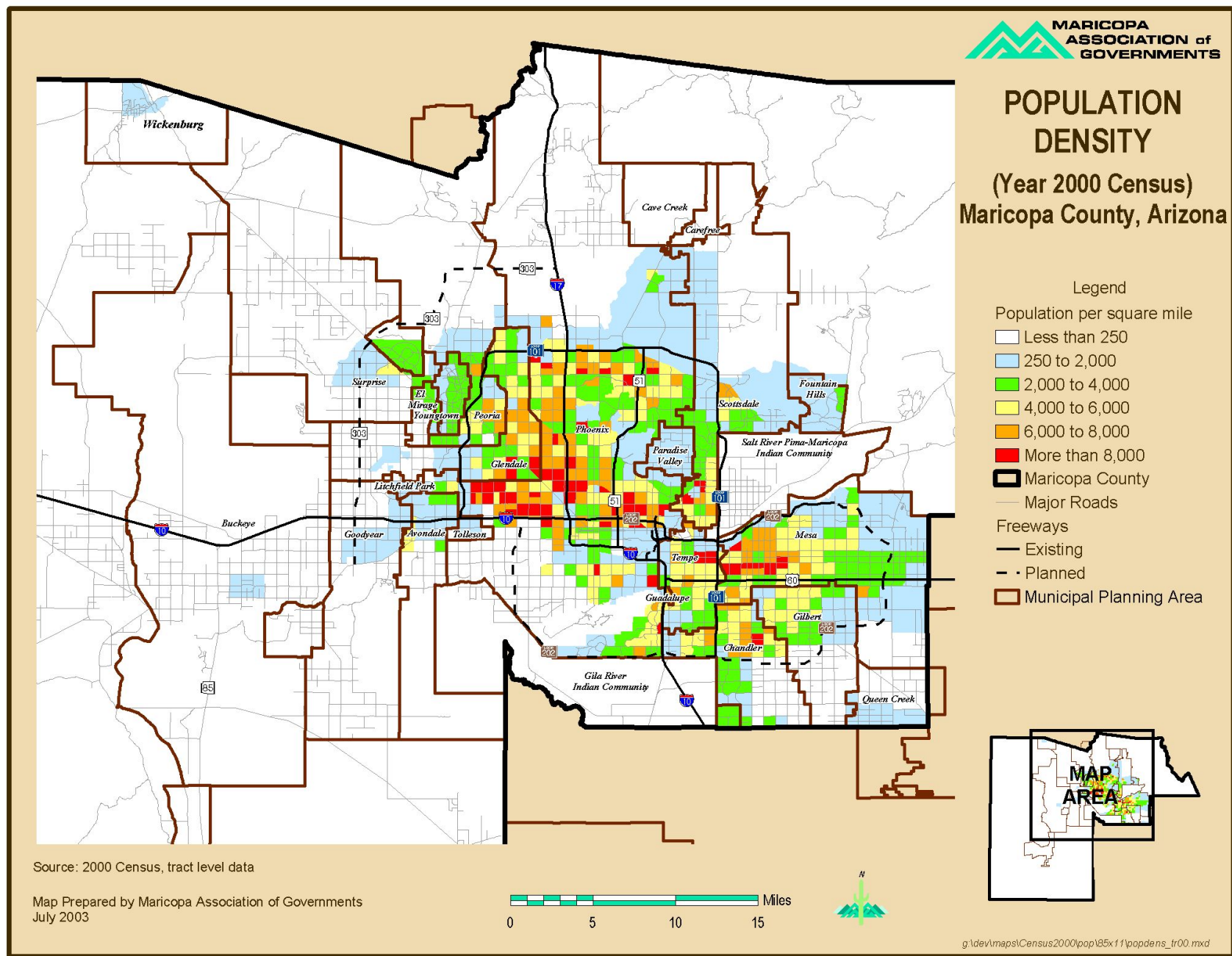


Figure 4-7: Population Density (2000)

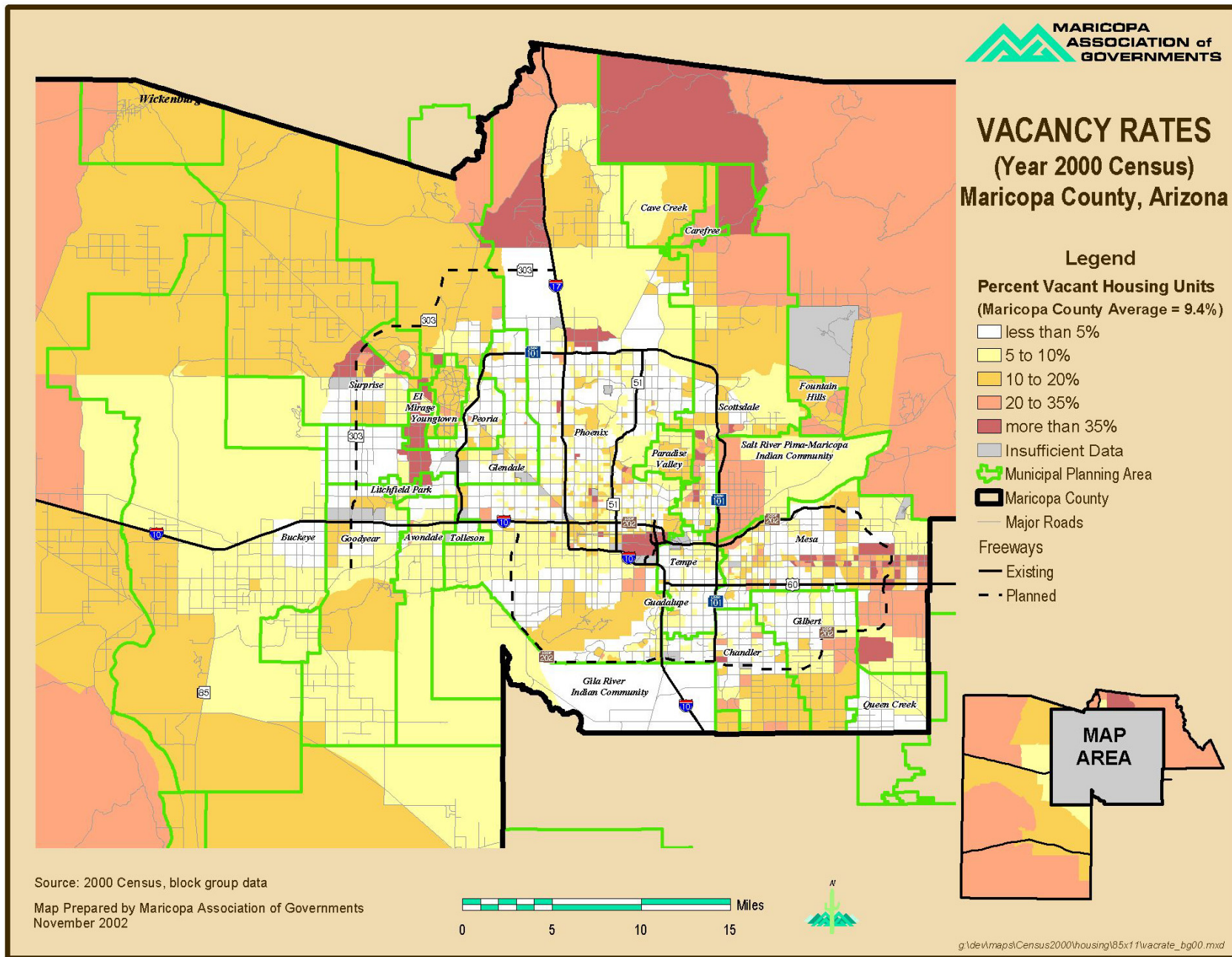


Figure 4-8: Vacancy Rates (2000)

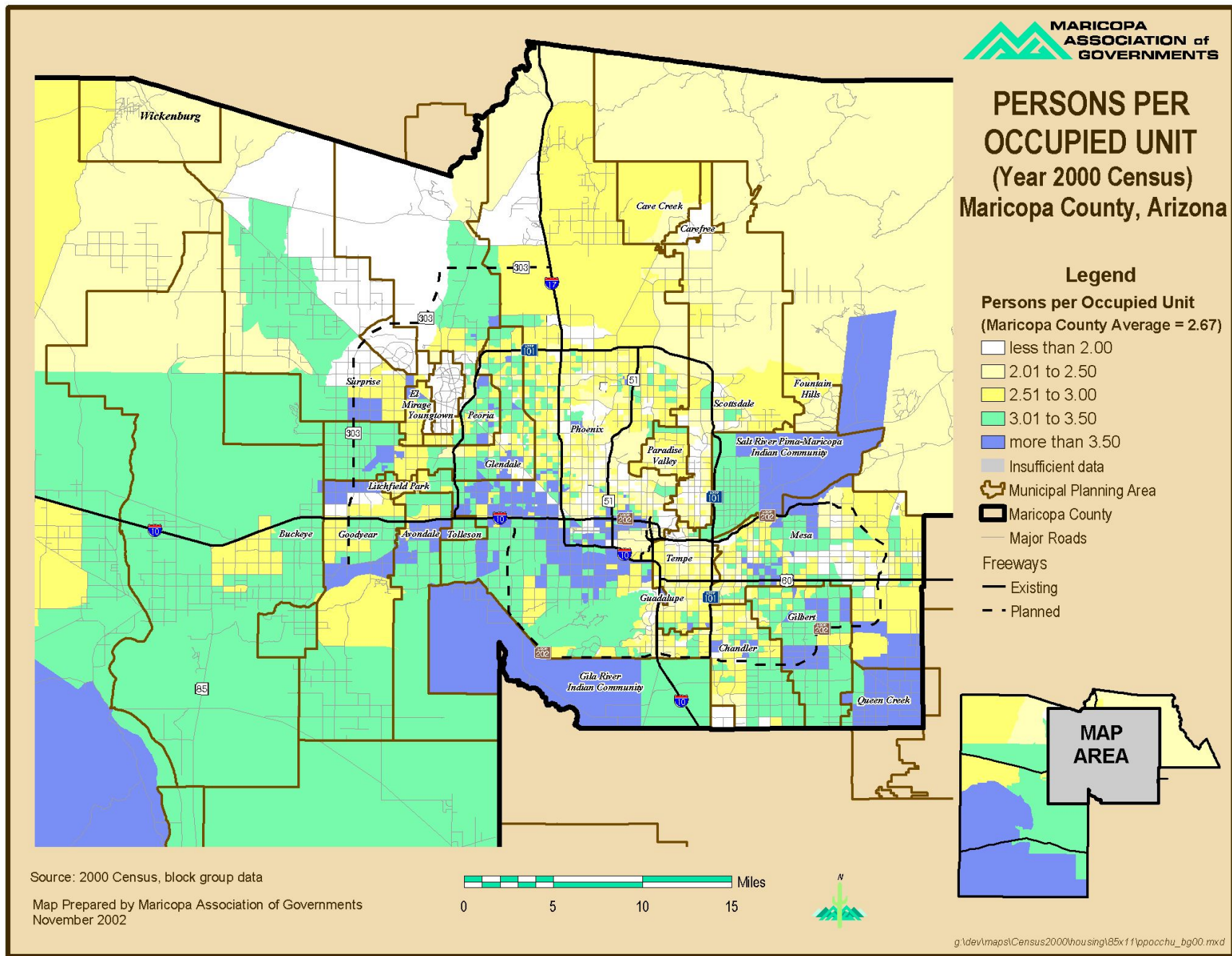


Figure 4-9: Persons Per Household (2000)

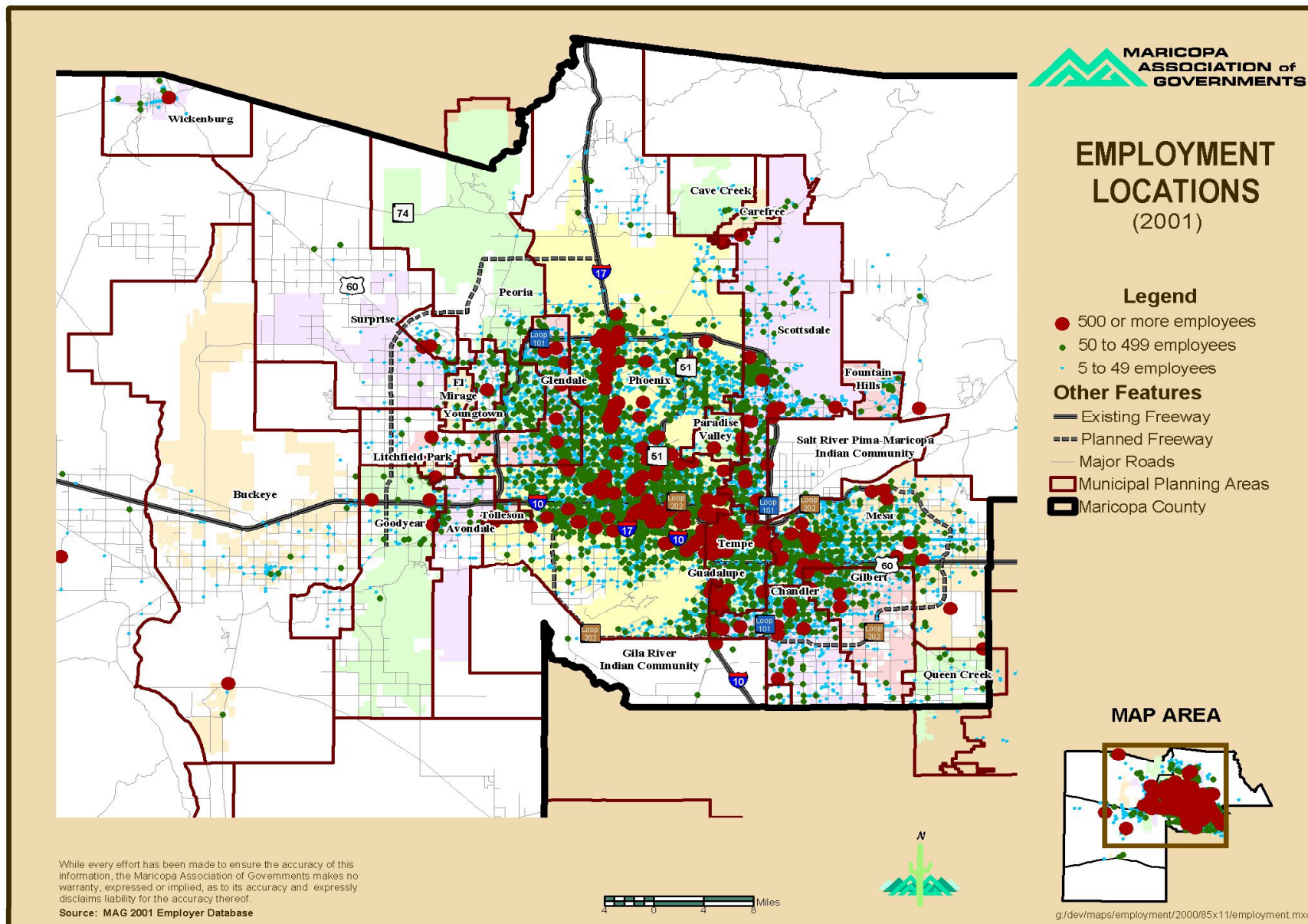


Figure 4-10: Employment Locations (2001)

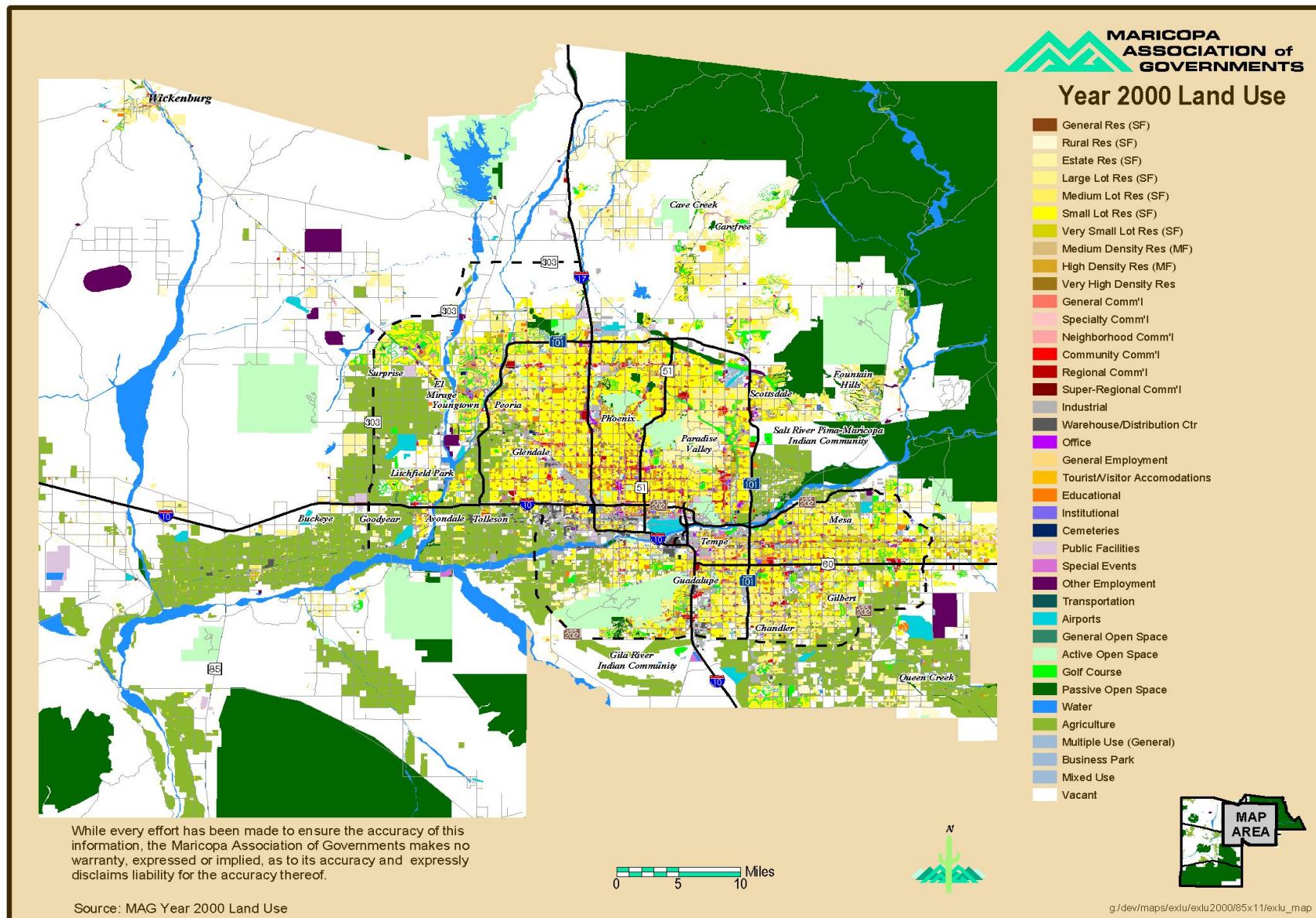


Figure 4-11: Existing Land Use (2000)

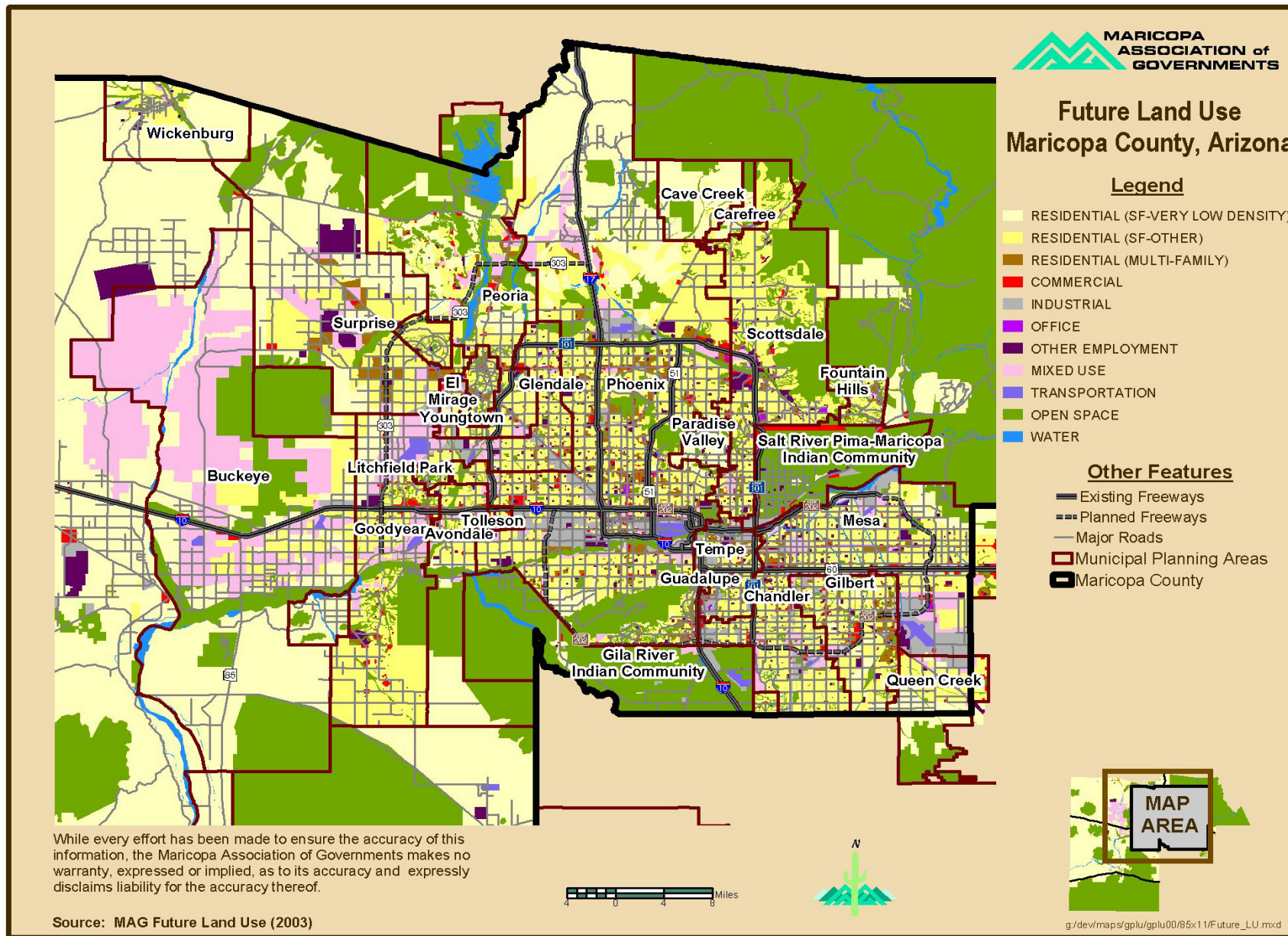


Figure 4-12: Future Land Use (2003)

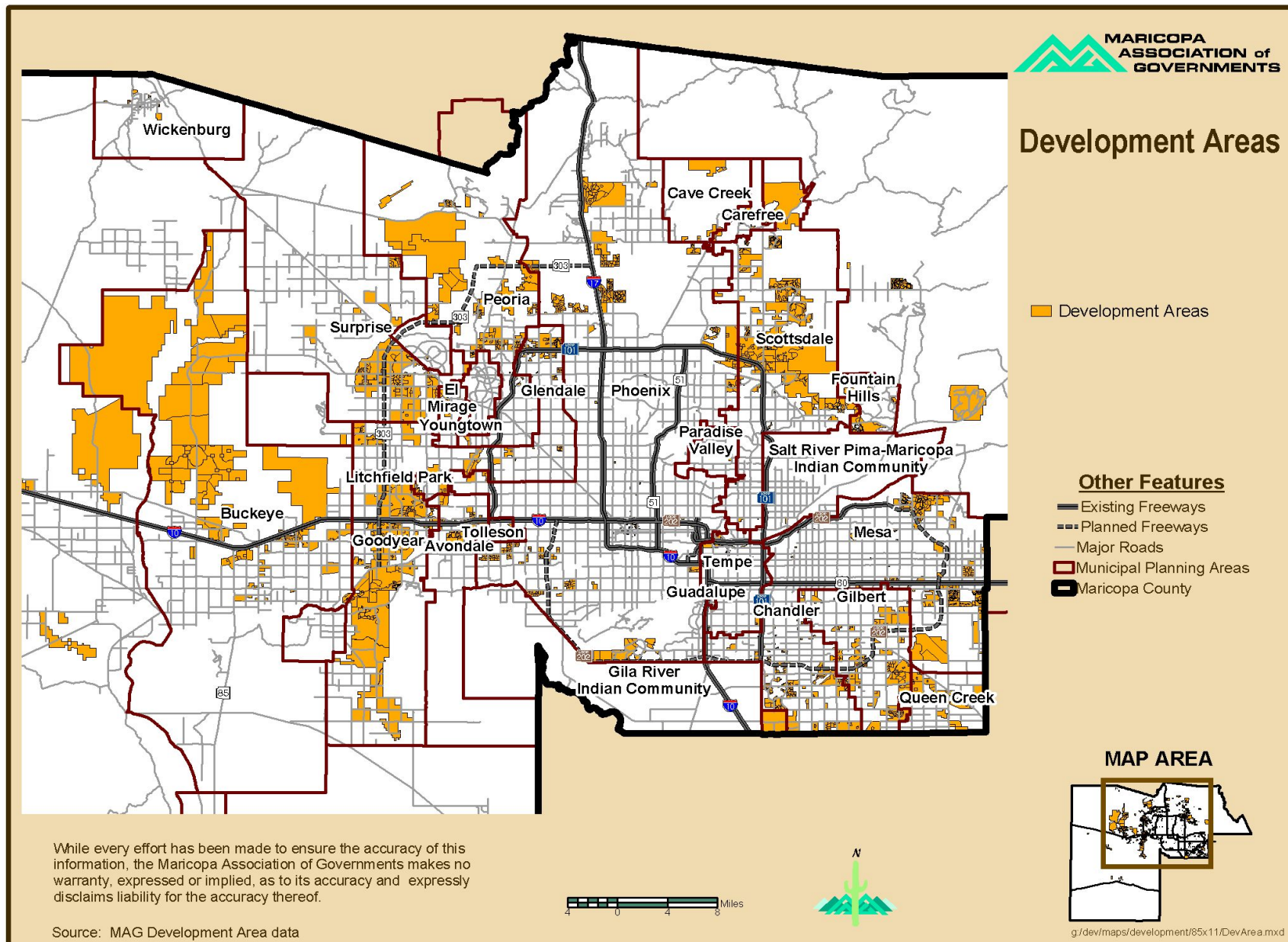


Figure 4-13: Large Scale Developments (2000)

Maricopa County Interim Socioeconomic Projections

Population

By 2030, Maricopa County is projected to have more than doubled its 2000 population. This means a growth of approximately a million people each decade. This section describes the growth trends projected in the County.

Tables 4-8, 4-9 and 4-10 present projected population by Municipal Planning Area (MPA). Table 6-1 shows the total resident population for Municipal Planning Areas (MPAs) from July 1, 2000 to July 1, 2030. Total resident population includes resident population in households and resident population in group quarters (dorms, nursing homes, prisons and military establishments). Table 4-9 shows the change in rank order of population size for 2000, 2010, 2020, and 2030; and Table 4-10 displays the absolute and percentage change in population over the 2000-2030 period.

Over the entire 30-year projection period, nearly all municipalities will experience rapid and/or substantial population growth. Between 2000 and 2030, the population of the United States is projected to grow at an average annual rate of 0.7%¹; in Maricopa County, only three of 27 MPAs are projected to grow slower than the nation. Five MPAs are projected to grow at average annual rates greater than 5% -- Buckeye, Goodyear, Queen Creek, Surprise, and Gila Bend. Eight more MPAs in Maricopa County are projected to grow at 2% annually or faster -- Avondale, El Mirage, Litchfield Park, Cave Creek, Gilbert, Peoria, Wickenburg, and Youngtown.

In terms of numbers, nine MPAs are projected to grow by more than 100,000 persons over the projection period -- Phoenix, Buckeye, Surprise, Goodyear, Mesa, Gilbert, Peoria, Avondale and Chandler. Another four MPAs are projected to experience population growth greater than 50,000 persons -- Scottsdale, Glendale, Queen Creek and the presently unincorporated county areas.

In the 30-year projection horizon, there are going to be a number of municipalities that achieve build out. "Build out" means that nearly all the developable land in a municipality's general plan has been developed. Currently, only Guadalupe, Paradise Valley, and Salt River Pima Maricopa Indian Community are more than 85% of their population at build out. By 2010, the number goes up to 8 MPAs with the addition of Scottsdale, Chandler, El Mirage, Tolleson, and Glendale. By 2020, more than half of the MPAs in Maricopa County are projected to be greater than 85% of their population at build out.

Currently, there are four MPAs with populations over 200,000 persons -- Phoenix, Mesa, Glendale and Scottsdale. By 2010, Chandler and Gilbert will join that list, and in 2020 so will Peoria.

By 2030, the largest MPA -- the Phoenix MPA -- will contain 2.2 million persons, followed by Mesa at 650,000. Four additional MPAs are likely to contain at least 300,000 persons -- Surprise, Buckeye, Goodyear and Glendale. An additional four MPAs are projected to have more than 200,000 people -- Scottsdale, Gilbert, Chandler and Peoria. Tempe is likely to be approaching 200,000 persons in 2030, while Avondale will likely be more than 160,000 and Queen Creek at 88,000 persons.

¹ Global Insights & Regional Economic Models, Inc.

Figures 4-14 through 4-17 display the population concentration for 2000 and the projection for 2010, 2020 and 2030. Population concentration measures the average population within a 1-mile radius. This analysis helps in smoothing out differences in geographies and in identifying underlying spatial patterns in the data.

The pattern of population concentrations illustrates the shape of urban form as it is projected to evolve according to local land use plans and densities.

In 2000, the highest densities (over 8,000 persons per square mile) of population concentrations were all in a regional urban core (Figure 4-14). That core is generally the area inside Loops 101 and 202, north of I-10. Developing lower density areas – those with 1,000 to 4,000 persons per square mile – were characteristic of the urban fringe. Another density category – 50 to 1,000 persons per square mile – was either rural or just beginning development. Generally, the developing urban fringe was inside Loop 202 in the Southeast Valley, inside Loop 303 in the West Valley, and just beyond Loop 101 in the North Valley.

By 2010, the highest and medium density population concentrations are projected to fill the Southeast Valley inside Loop 202, to be denser in the West Valley north of I-10, and to expand around Sun City in the Northwest Valley (Figure 4-15). There is very little change in the projections for 2020 and 2030 for these higher density concentrations, so the region's high and medium density core is projected to be established by 2010. It contains many distinct highest-density areas. The developing urban fringe is projected to expand, around the entire periphery of the urban area. Newly developing areas are projected to push the urban fringe primarily along transportation corridors.

By 2020, the Northeast Valley is projected to be built out, along with much of the Southeast Valley in Maricopa County (Figure 4-16). The developing portion of the urban fringe is projected to expand primarily east in Pinal County, along I-10 south of the White Tank Mountains in the Southwest Valley, around Loop 303 and Grand Avenue in the Northwest Valley, and around I-17 and Cave Creek Road in the North.

By 2030, the most notable characteristic is the continued expansion of the developing urban fringe, which is projected to expand well beyond the existing regional freeway network (Figure 4-17). The direction of growth is north, northwest, and southwest (west of the White Tank Mountains) in Maricopa County, as well as into Pinal County. The newly expanding urban fringe is projected to push further north, further west of the White Tank Mountains, and further south towards Gila Bend in Maricopa County.

**Table 4-8: Total Resident Population by Municipal Planning Area (MPA), Maricopa County
July 1, 2000 and Interim Projections July 1, 2010 to July 1, 2030**

Municipal Planning Area (MPA)	Total Resident Population 2000	Total Resident Population 2010	Total Resident Population 2020	Total Resident Population 2030
Avondale	37,800	82,100	122,500	161,400
Buckeye	16,700	58,600	153,400	380,600
Carefree	3,000	4,000	4,800	4,900
Cave Creek	3,900	5,100	5,800	12,900
Chandler	185,300	260,000	286,600	288,600
County Areas	85,300	92,900	109,900	138,000
El Mirage	8,700	29,700	31,400	33,100
Fountain Hills	20,500	24,700	30,400	30,700
Gila Bend	2,300	2,800	6,000	17,800
Gila River*	2,700	3,200	4,200	5,200
Gilbert	119,200	202,800	280,300	290,500
Glendale	230,300	290,400	308,100	312,200
Goodyear	21,200	61,300	161,100	330,400
Guadalupe	5,200	5,200	5,500	5,600
Litchfield Park	3,800	7,000	13,700	14,200
Mesa	441,800	537,900	617,800	647,800
Paradise Valley	14,100	15,200	15,700	15,900
Peoria*	114,100	160,800	206,600	253,400
Phoenix	1,350,500	1,700,300	2,022,500	2,187,500
Queen Creek*	7,400	18,900	58,300	88,100
Salt River	6,500	7,400	7,500	7,500
Scottsdale	204,300	253,100	287,300	292,700
Surprise	37,700	115,200	213,300	395,500
Tempe	158,900	176,400	189,200	196,700
Tolleson	5,000	6,100	6,200	6,300
Wickenburg	7,400	7,700	10,000	16,000
Youngtown	3,000	5,400	6,200	6,600
TOTAL	3,096,600	4,134,400	5,164,100	6,140,000

Source: Maricopa Association of Governments, Interim Projections, June 25, 2003

Notes:

Total resident population includes resident population in households and resident population in group quarters (dorms, nursing homes, prisons and military establishments)

*These projections include the Maricopa County portion of Peoria, Queen Creek and the Gila River Indian Community only.

MPA numbers rounded to nearest 100. County numbers may not add due to rounding.

Please refer to Caveats for Interim Projections for complete notation on this series.

**Table 4-9: Population Rank Order by Municipal Planning Area (MPA)
Maricopa County (2000-2030)**

RANK	Municipal Planning Areas (MPA)	Total Resident Population 2000	RANK	Municipal Planning Areas (MPA)	Total Resident Population 2010	RANK	Municipal Planning Areas (MPA)	Total Resident Population 2020	RANK	Municipal Planning Areas (MPA)	Total Resident Population 2030
1	Phoenix	1,350,500	1	Phoenix	1,700,300	1	Phoenix	2,022,500	1	Phoenix	2,187,500
2	Mesa	441,800	2	Mesa	537,900	2	Mesa	617,800	2	Mesa	647,800
3	Glendale	230,300	3	Glendale	290,400	3	Glendale	308,100	3	Surprise	395,500
4	Scottsdale	204,300	4	Chandler	260,000	4	Scottsdale	287,300	4	Buckeye	380,600
5	Chandler	185,300	5	Scottsdale	253,100	5	Chandler	286,600	5	Goodyear	330,400
6	Tempe	158,900	6	Gilbert	202,800	6	Gilbert	280,300	6	Glendale	312,200
7	Gilbert	119,200	7	Tempe	176,400	7	Surprise	213,300	7	Scottsdale	292,700
8	Peoria*	114,100	8	Peoria*	160,800	8	Peoria*	206,600	8	Gilbert	290,500
9	County Areas	85,300	9	Surprise	115,200	9	Tempe	189,200	9	Chandler	288,600
10	Avondale	37,800	10	County Areas	92,900	10	Goodyear	161,100	10	Peoria*	253,400
11	Surprise	37,700	11	Avondale	82,100	11	Buckeye	153,400	11	Tempe	196,700
12	Goodyear	21,200	12	Goodyear	61,300	12	Avondale	122,500	12	Avondale	161,400
13	Fountain Hills	20,500	13	Buckeye	58,600	13	County Areas	109,900	13	County Areas	138,000
14	Buckeye	16,700	14	El Mirage	29,700	14	Queen Creek*	58,300	14	Queen Creek*	88,100
15	Paradise Valley	14,100	15	Fountain Hills	24,700	15	El Mirage	31,400	15	El Mirage	33,100
16	El Mirage	8,700	16	Queen Creek*	18,900	16	Fountain Hills	30,400	16	Fountain Hills	30,700
17	Queen Creek*	7,400	17	Paradise Valley	15,200	17	Paradise Valley	15,700	17	Gila Bend	17,800
18	Wickenburg	7,400	18	Wickenburg	7,700	18	Litchfield Park	13,700	18	Wickenburg	16,000
19	Salt River	6,500	19	Salt River	7,400	19	Wickenburg	10,000	19	Paradise Valley	15,900
20	Guadalupe	5,200	20	Litchfield Park	7,000	20	Salt River	7,500	20	Litchfield Park	14,200
21	Tolleson	5,000	21	Tolleson	6,100	21	Tolleson	6,200	21	Cave Creek	12,900
22	Cave Creek	3,900	22	Youngtown	5,400	22	Youngtown	6,200	22	Salt River	7,500
23	Litchfield Park	3,800	23	Guadalupe	5,200	23	Gila Bend	6,000	23	Youngtown	6,600
24	Carefree	3,000	24	Cave Creek	5,100	24	Cave Creek	5,800	24	Tolleson	6,300
25	Youngtown	3,000	25	Carefree	4,000	25	Guadalupe	5,500	25	Guadalupe	5,600
26	Gila River*	2,700	26	Gila River*	3,200	26	Carefree	4,800	26	Gila River*	5,200
27	Gila Bend	2,300	27	Gila Bend	2,800	27	Gila River*	4,200	27	Carefree	4,900

Source: Maricopa Association of Governments, Interim Projections, June 25, 2003

Notes:

Total resident population includes resident population in households and resident population in group quarters (dorms, nursing homes, prisons and military establishments)

*These projections include the Maricopa County portion of Peoria, Queen Creek and the Gila River Indian Community only.

MPA numbers rounded to nearest 100.

Please refer to Caveats for Interim Projections for complete notation on this series.

Table 4-10: Population Change by Municipal Planning Area (MPA)

Municipal Planning Area (MPA)	Absolute Change 2000-2010	Percent Change 2000-2010	Absolute Change 2010-2020	Percent Change 2010-2020	Absolute Change 2020-2030	Percent Change 2020-2030	Absolute Change 2000-2030	Percent Change 2000-2030	Annual Rate 2000-2030
Avondale	44,300	117.20%	40,400	49.21%	38,900	31.76%	123,600	326.98%	4.96%
Buckeye	41,900	250.90%	94,800	161.77%	227,200	148.11%	363,900	2179.04%	10.98%
Carefree	1,000	33.33%	800	20.00%	100	2.08%	1,900	63.33%	1.65%
Cave Creek	1,200	30.77%	700	13.73%	7,100	122.41%	9,000	230.77%	4.07%
Chandler	74,700	40.31%	26,600	10.23%	2,000	0.70%	103,300	55.75%	1.49%
County Areas	7,600	8.91%	17,000	18.30%	28,100	25.57%	52,700	61.78%	1.62%
El Mirage	21,000	241.38%	1,700	5.72%	1,700	5.41%	24,400	280.46%	4.55%
Fountain Hills	4,200	20.49%	5,700	23.08%	300	0.99%	10,200	49.76%	1.36%
Gila Bend	500	21.74%	3,200	114.29%	11,800	196.67%	15,500	673.91%	7.06%
Gila River*	500	18.52%	1,000	31.25%	1,000	23.81%	2,500	92.59%	2.21%
Gilbert	83,600	70.13%	77,500	38.21%	10,200	3.64%	171,300	143.71%	3.01%
Glendale	60,100	26.10%	17,700	6.10%	4,100	1.33%	81,900	35.56%	1.02%
Goodyear	40,100	189.15%	99,800	162.81%	169,300	105.09%	309,200	1458.49%	9.59%
Guadalupe	-	0.00%	300	5.77%	100	1.82%	400	7.69%	0.25%
Litchfield Park	3,200	84.21%	6,700	95.71%	500	3.65%	10,400	273.68%	4.49%
Mesa	96,100	21.75%	79,900	14.85%	30,000	4.86%	206,000	46.63%	1.28%
Paradise Valley	1,100	7.80%	500	3.29%	200	1.27%	1,800	12.77%	0.40%
Peoria*	46,700	40.93%	45,800	28.48%	46,800	22.65%	139,300	122.09%	2.70%
Phoenix	349,800	25.90%	322,200	18.95%	165,000	8.16%	837,000	61.98%	1.62%
Queen Creek*	11,500	155.41%	39,400	208.47%	29,800	51.11%	80,700	1090.54%	8.61%
Salt River	900	13.85%	100	1.35%	-	0.00%	1,000	15.38%	0.48%
Scottsdale	48,800	23.89%	34,200	13.51%	5,400	1.88%	88,400	43.27%	1.21%
Surprise	77,500	205.57%	98,100	85.16%	182,200	85.42%	357,800	949.07%	8.15%
Tempe	17,500	11.01%	12,800	7.26%	7,500	3.96%	37,800	23.79%	0.71%
Tolleson	1,100	22.00%	100	1.64%	100	1.61%	1,300	26.00%	0.77%
Wickenburg	300	4.05%	2,300	29.87%	6,000	60.00%	8,600	116.22%	2.60%
Youngtown	2,400	80.00%	800	14.81%	400	6.45%	3,600	120.00%	2.66%
TOTAL	1,037,600	33.51%	1,030,100	24.92%	975,800	18.90%	3,043,500	98.29%	2.31%

Source: Maricopa Association of Governments, Interim Projections, June 25, 2003

Notes:

*These projections include the Maricopa County portion of Peoria, Queen Creek and the Gila River Indian Community only.

MPA numbers rounded to nearest 100. County numbers may not add due to rounding.

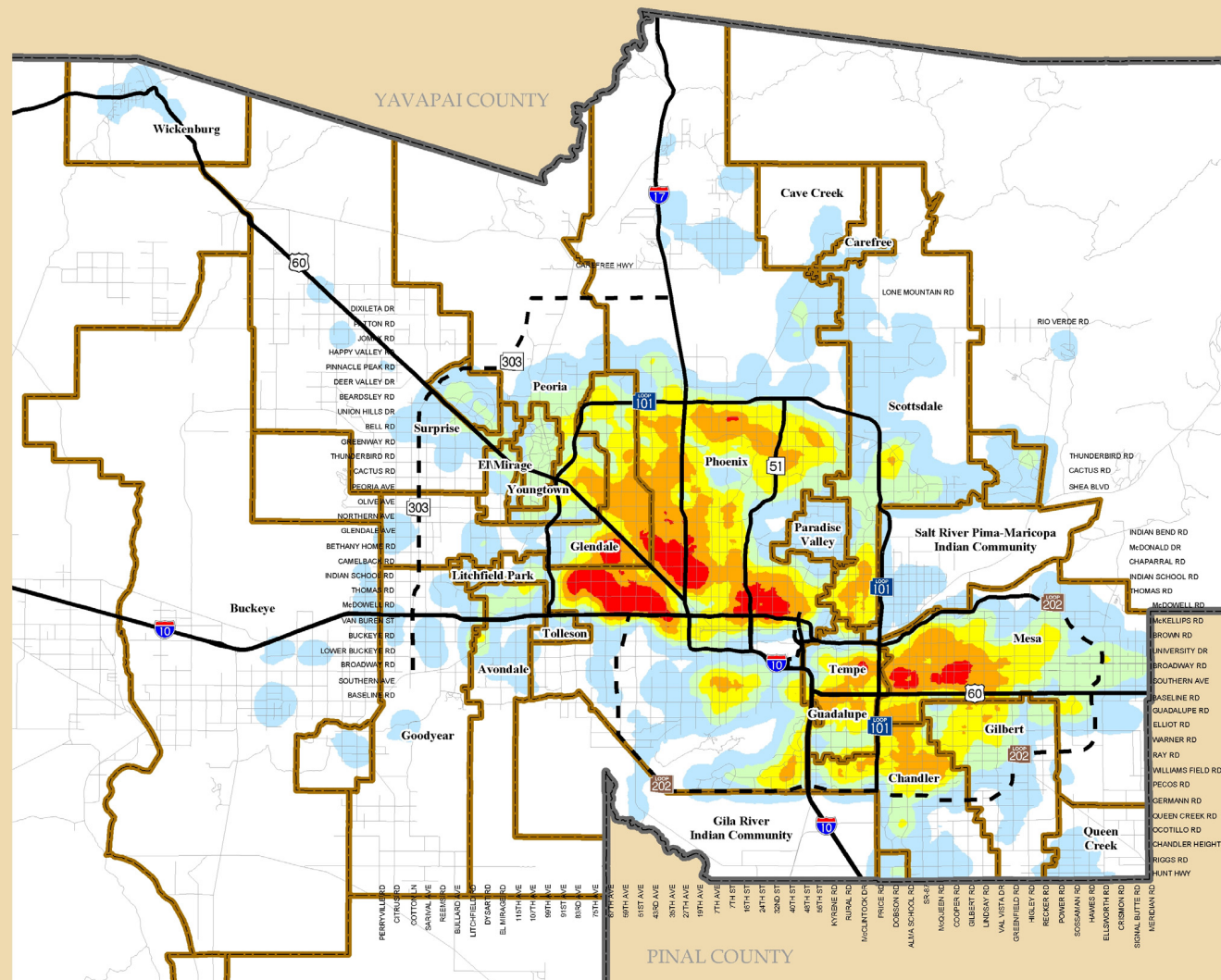
Please refer to Caveats for Interim Projections for complete notation on this series.

2000 Population Concentration for Interim Socioeconomic Projections*

Persons per Square Mile
(Maricopa County Average = 336)

- 0 - 250
- 250 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- More than 8,000

- County Boundary
- MPA Boundaries
- Existing Freeways/Expressways
- Planned Freeways/Expressways
- Major Roads

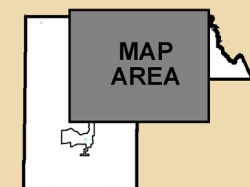


While every effort has been made to ensure the accuracy of this information, the Maricopa Association of Governments makes no warranty, expressed or implied, as to its accuracy and expressly disclaims liability for the accuracy thereof.

0 5 10 15 Miles



*Based on Interim projections by Municipal Planning Area (MPA) and Regional Analysis Zone (RAZ) for 2010, 2020, 2025 and 2030 accepted by MAG Regional Council on June 25, 2003.



Prepared by Maricopa Association of Governments, July 2003

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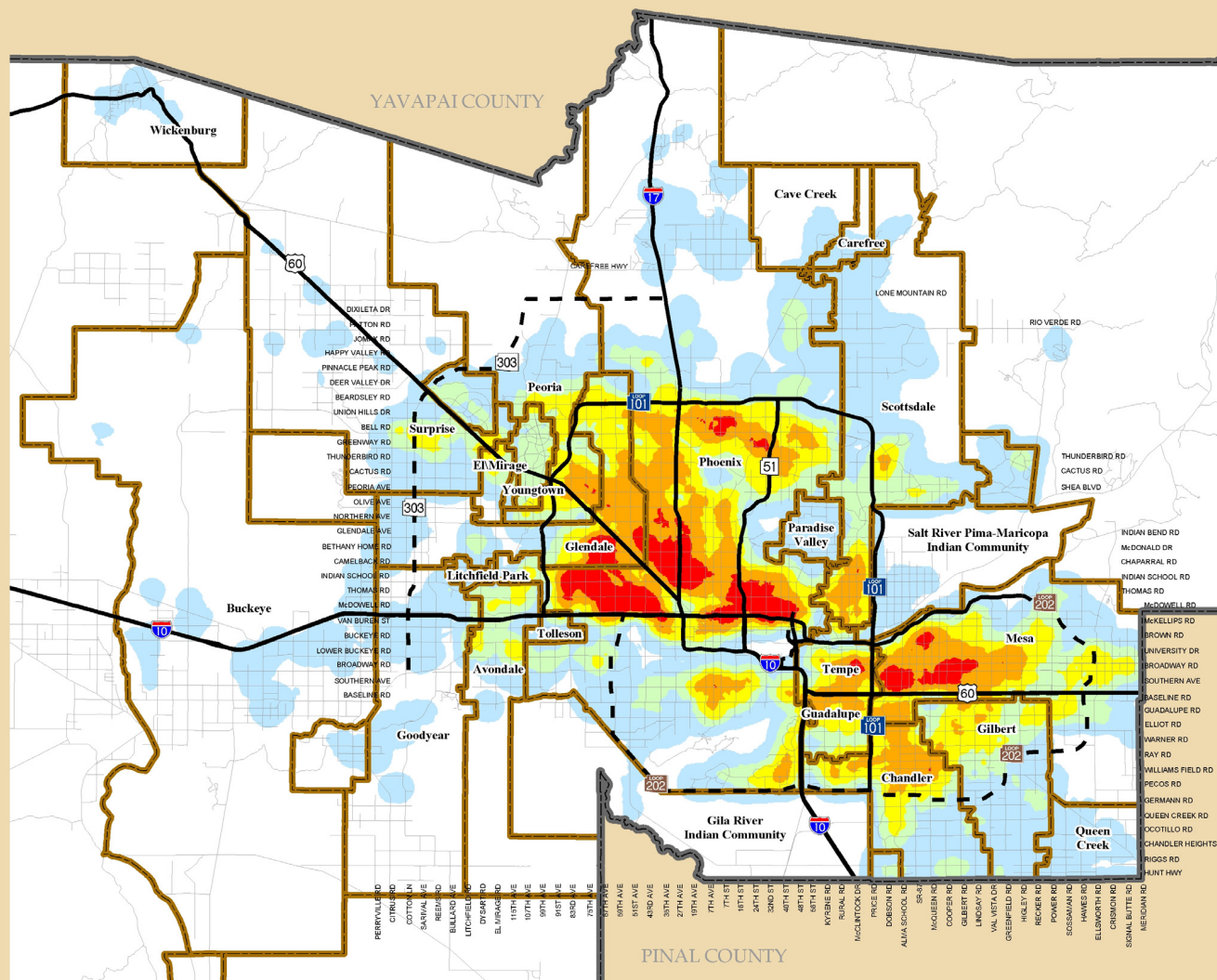
Figure 4-14: Population Concentration (2000)

2010 Population Concentration for Interim Socioeconomic Projections*

Persons per Square Mile
(Maricopa County Average = 448)

- 0 - 250
- 250 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- More than 8,000

- County Boundary
- MPA Boundaries
- Existing Freeways/Expressways
- Planned Freeways/Expressways
- Major Roads

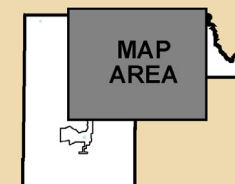


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*Based on Interim projections by Municipal Planning Area (MPA) and Regional Analysis Zone (RAZ) for 2010, 2020, 2025 and 2030 accepted by MAG Regional Council on June 25, 2003.



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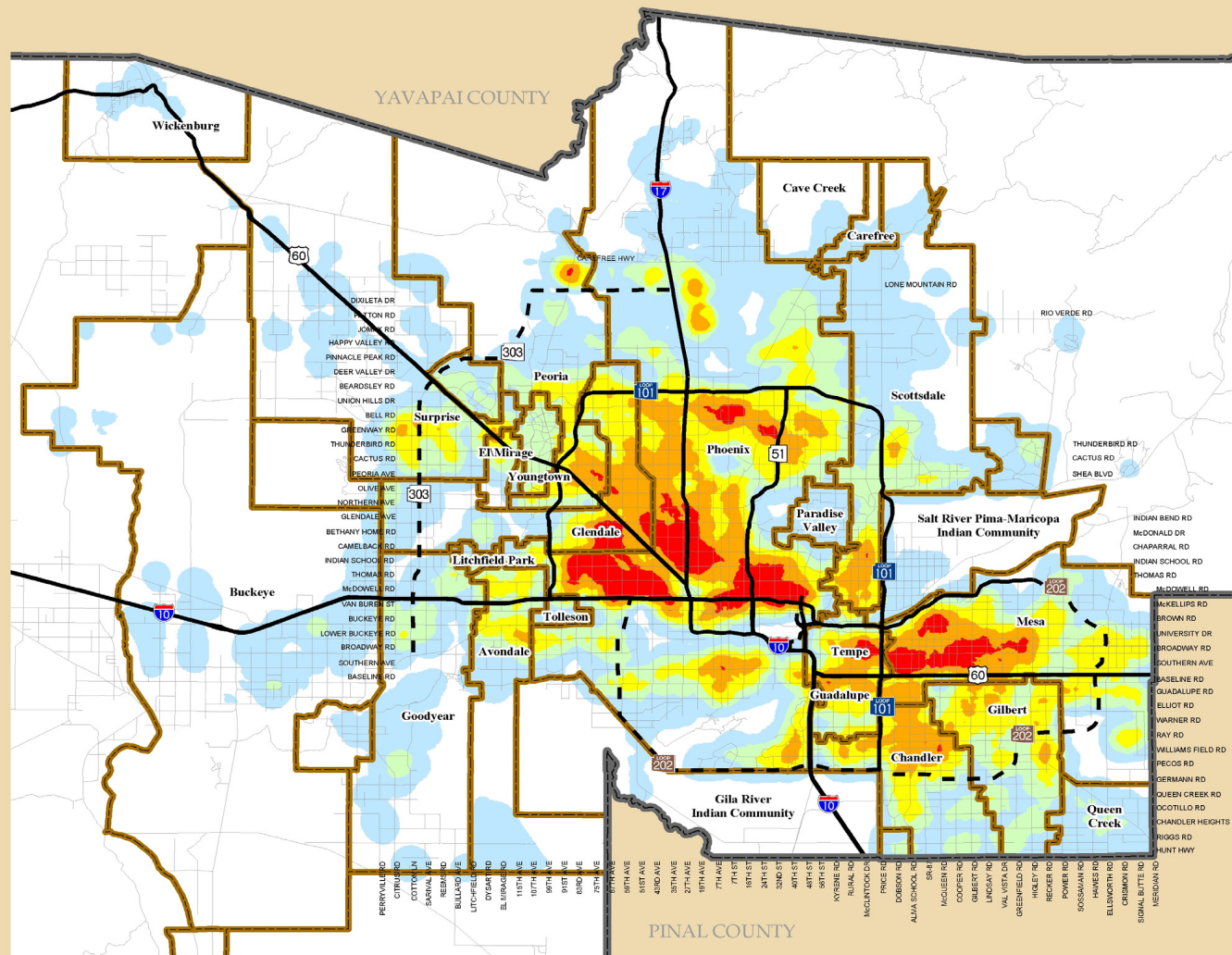
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Figure 4-15: Population Concentration (2010)

2020 Population Concentration for Interim Socioeconomic Projections*

Persons per Square Mile
(Maricopa County Average = 560)

- 0 - 250
- 250 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- More than 8,000
- County Boundary
- MPA Boundaries
- Existing Freeways/Expressways
- Planned Freeways/Expressways
- Major Roads

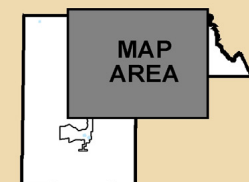


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0 5 10 15 Miles



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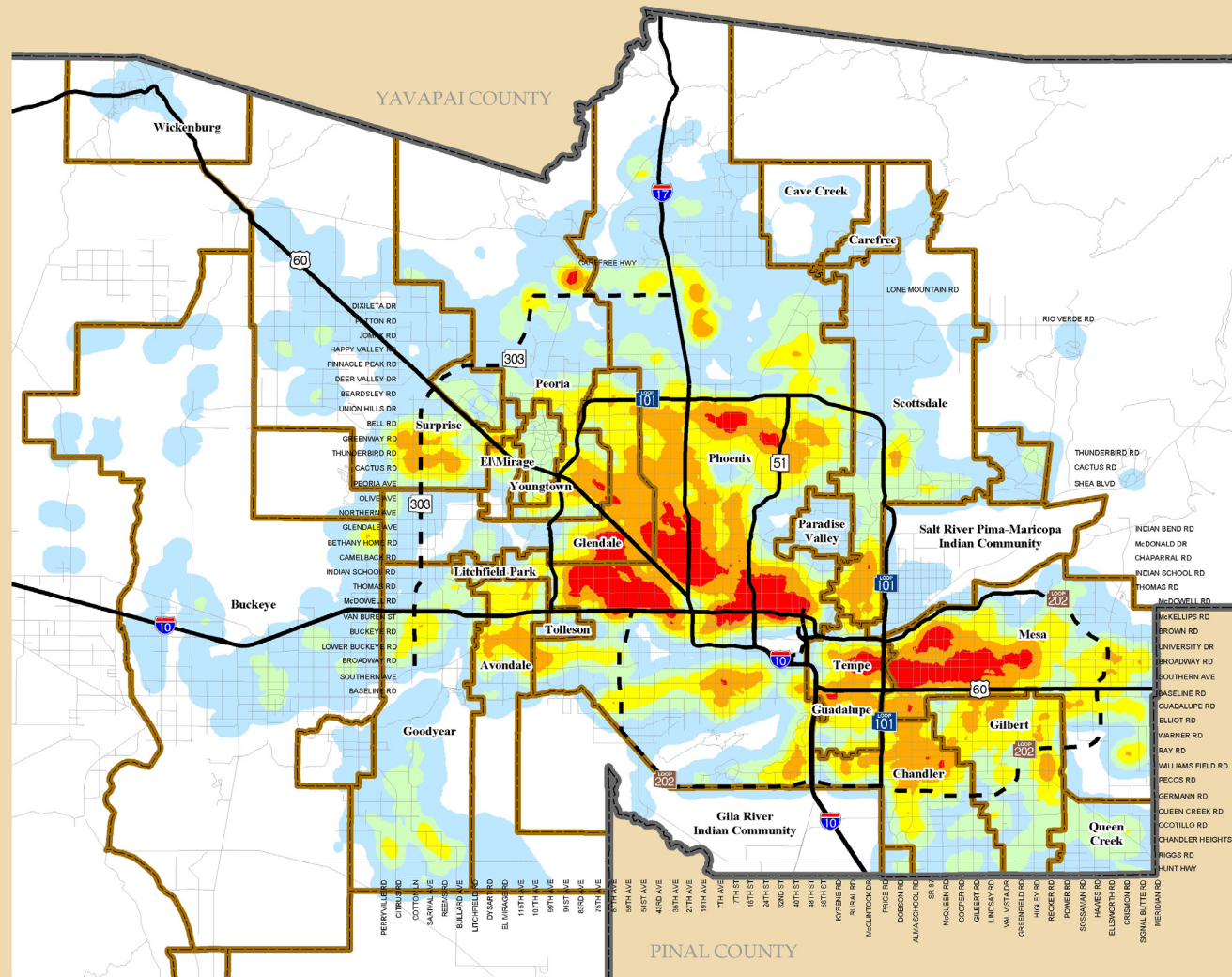
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Figure 4-16: Population Concentration (2020)

2030 Population Concentration for Interim Socioeconomic Projections*

Persons per Square Mile
(Maricopa County Average = 666)

- 0 - 250
- 250 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- More than 8,000
- County Boundary
- MPA Boundaries
- Existing Freeways/Expressways
- Planned Freeways/Expressways
- Major Roads

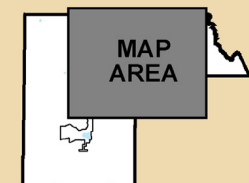


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0 5 10 15 Miles



*Based on Interim projections by Municipal Planning Area (MPA) and Regional Analysis Zone (RAZ) for 2010, 2020, 2025 and 2030 accepted by MAG Regional Council on June 25, 2003.



Prepared by Maricopa Association of Governments, July 2003

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Figure 4-17: Population Concentration (2030)

Employment

By 2030, Maricopa County is projected to have more than doubled its 2000 employment. This section describes the employment growth trends projected in the County. Note that the employment projections are by place of work and not by place of residence as reported by Census Bureau.

Tables 4-11 and 4-12 present projected employment by Municipal Planning Area (MPA). Table 4-11 shows the total employment by MPA from July 1, 2000 to July 1, 2030. Total employment category includes work-at-home and construction employment. Since construction employment follows development, employment projections may show declines in future years. Table 4-12 displays absolute and percentage change in employment over the 30-year projection period.

Maricopa County jobs are projected to grow at a faster rate than population; over the 30-year projection period, the number of jobs is projected to grow at an average annual rate of 2.6%, compared to 2.3% for population. By comparison, the number of jobs in the United States is projected to grow at an average annual rate of 1.4% (Global Insights & REMI), less than half the rate in Maricopa County. Most MPAs in Maricopa County are projected to have faster job growth than the nation; only Youngtown (1.2%), Scottsdale (1.2%) and Paradise Valley (0.3%) are projected to have average annual growth rates at or below the national rate.

Compared to 2000, a more equal distribution of jobs by place of work between MPA's is projected. Although the Phoenix MPA is expected to contain the most jobs in the county, its share declines - from 47% of all jobs in 2000 to 37% in 2030. Further, in 2000 the top four MPA's - Phoenix, Mesa, Tempe and Scottsdale, respectively - contained 78% of all jobs by place of work; by 2030, their share is projected to decline to 60% (Table 4-12).

Although the rank order of these four MPAs does not change between 2000 and 2030, there is considerable movement between other MPAs. In particular, absolute and percentage change is high for the following MPAs (Table 6-6): Buckeye (187,000 jobs), Chandler (113,000), Peoria (113,000), Surprise (109,000), Glendale (106,000), Goodyear (92,000), Gilbert (83,000), Avondale (50,000) and Queen Creek (35,000).

In 2000, Phoenix ranks above all other MPAs, with 740,000 jobs; a second tier of MPAs are Mesa, Tempe, and Scottsdale, all with 150,000 to 170,000 jobs; followed by a third tier - Glendale and Chandler, with 70,000 to 85,000 jobs; a fourth tier - Gilbert and Peoria, with 28,000 to 35,000 jobs; and a fifth tier - Goodyear, Tolleson, and Avondale, with 9,000 to 14,000 jobs.

By 2030 the Phoenix MPA, with 1.3 million jobs, has 4 times as many jobs as the next MPA, Mesa at 320,000 jobs. There is then a third tier of MPAs - Tempe, Scottsdale, Buckeye, Glendale and Chandler, with 185,000 to 240,000 jobs; followed by a fourth tier - Peoria, Surprise, Gilbert and Goodyear, with 106,000 to 142,000 jobs; a fifth tier - Avondale, Queen Creek and Tolleson, with 30,000 to 60,000 jobs; and a sixth tier - El Mirage and the Salt River Pima-Maricopa Indian Community, with about 20,000 jobs.

Between 2000 and 2030, Maricopa County job growth is projected to be 1.8 million jobs - 547,000 jobs between 2000 and 2010, 593,000 jobs between 2010 and 2020, and 672,000 jobs between 2020 and 2030. A maturing set of MPAs that either achieve build out or have a significant slowdown in growth rate during the projection period include Mesa, Chandler, Gilbert,

Tempe, Scottsdale and Avondale. A set of developing MPAs that have much higher growth rates than average include Buckeye, Peoria, Surprise, Glendale and Goodyear.

Figures 4-18 through 4-21 display the employment concentration for 2000 and the projections for 2010, 2020 and 2030. Employment concentration measures the average employment within a 1-mile radius. This analysis helps in smoothing out differences in geographies and in identifying underlying spatial patterns in the data. Unlike resident population, which defines the urban fringe, there is a greater concentration of job-generating land uses within more centralized areas within the urban form. Moreover, job density concentrations are located within all sub-regions of the County and the employment concentrations are predominantly located along regional freeway corridors.

- In 2000, the areas of greatest job density (more than 4,000 jobs per square mile) are mainly located in a large geographic center of Maricopa County, inside Loop 101 to the north, and Loop 202 to the south, and along the I-17 corridor. The greatest concentration is even more centralized in two major cores: in central Phoenix, and in the west-most Southeast Valley (Figure 4-18). There are also scattered concentrations along Loop 101 north, along I-10 west, along Grand Avenue, along I-10 south, and along Loop 101 south. A significant amount of existing job concentration is along the core of the region's freeway system, generally along I-10 just north of the planned Loop 202, through the core of County, to I-10 west of I-17.
- By 2010, projected job growth continues in the same general locations as 2000, with more non-residential development along I-10 west, Loop 101 south, and in the far eastern Southeast Valley. Projected job concentration in the central region has a higher density (Figures 4-19).
- By 2020, the concentrations in the two major central cores are projected again to be denser, and there is greater projected job growth in the far southern Southeast Valley, along I-10 west to Loop 101, and along I-17 north of Loop 101. There are also scattered concentrations in the West Valley (Figures 4-20).
- Between 2020 and 2030, there is less of a change in job density in the two major central cores. Projected growth in job density is in fringe areas – between Loops 101 and 303 in the west, along Loop 202 in the far Southeast Valley, and I-17 north of Loop 101 (Figures 4-21).

**Table 4-11: Total Employment by Municipal Planning Area (MPA), Maricopa County
July 1, 2000 and Interim Projections July 1, 2010 to July 1, 2030**

Municipal Planning Area (MPA)	Total Employment 2000	Total Employment 2010	Total Employment 2020	Total Employment 2030
Avondale	9,000	21,900	50,800	59,400
Buckeye	7,100	26,200	64,200	194,400
Carefree	1,500	2,700	3,200	3,200
Cave Creek	800	1,900	2,100	3,700
Chandler	71,000	134,900	166,100	184,500
County Areas	31,800	33,400	37,100	54,500
El Mirage	1,900	4,500	9,200	23,600
Fountain Hills	4,300	7,700	9,000	8,600
Gila Bend	1,200	1,900	2,800	11,700
Gila River*	3,700	4,800	6,700	8,700
Gilbert	35,000	70,300	101,100	118,200
Glendale	84,500	130,500	158,300	190,200
Goodyear	13,900	30,900	66,800	105,800
Guadalupe	600	1,600	1,600	1,800
Litchfield Park	1,200	3,600	4,600	4,300
Mesa	172,000	240,600	293,900	318,100
Paradise Valley	5,400	5,600	5,900	5,900
Peoria*	28,400	51,300	87,400	141,500
Phoenix	741,000	900,100	1,093,200	1,264,100
Queen Creek*	1,700	6,400	19,800	36,800
Salt River	7,300	7,800	9,100	19,600
Scottsdale	152,100	181,300	205,900	214,800
Surprise	9,000	28,100	51,000	118,400
Tempe	162,400	191,400	227,500	241,100
Tolleson	12,800	16,000	20,300	30,900
Wickenburg	4,100	4,900	6,000	11,600
Youngtown	1,200	1,700	1,600	1,700
TOTAL	1,564,900	2,112,000	2,705,000	3,377,000

Source: Maricopa Association of Governments, Interim Projections, June 25, 2003

Notes:

Because construction employment follows development, employment projections may show declines in future years.

*These projections include the Maricopa County portion of Peoria, Queen Creek and the Gila River Indian Community only.

MPA numbers rounded to nearest 100. County numbers may not add due to rounding.

Please refer to Caveats for Interim Projections for complete notation on this series.

Table 4-12: Employment Change by Municipal Planning Area (MPA)

Municipal Planning Area (MPA)	Absolute Change 2000-2010	Percent Change 2000-2010	Absolute Change 2010-2020	Percent Change 2010-2020	Absolute Change 2020-2030	Percent Change 2020-2030	Absolute Change 2000-2030	Percent Change 2000-2030	Annual Rate 2000-2030
Avondale	12,900	143.33%	28,900	131.96%	8,600	16.93%	50,400	560.00%	6.49%
Buckeye	19,100	269.01%	38,000	145.04%	130,200	202.80%	187,300	2638.03%	11.66%
Carefree	1,200	80.00%	500	18.52%	-	0.00%	1,700	113.33%	2.56%
Cave Creek	1,100	137.50%	200	10.53%	1,600	76.19%	2,900	362.50%	5.24%
Chandler	63,900	90.00%	31,200	23.13%	18,400	11.08%	113,500	159.86%	3.23%
County Areas	1,600	5.03%	3,700	11.08%	17,400	46.90%	22,700	71.38%	1.81%
El Mirage	2,600	136.84%	4,700	104.44%	14,400	156.52%	21,700	1142.11%	8.76%
Fountain Hills	3,400	79.07%	1,300	16.88%	(400)	-4.44%	4,300	100.00%	2.34%
Gila Bend	700	58.33%	900	47.37%	8,900	317.86%	10,500	875.00%	7.89%
Gila River*	1,100	29.73%	1,900	39.58%	2,000	29.85%	5,000	135.14%	2.89%
Gilbert	35,300	100.86%	30,800	43.81%	17,100	16.91%	83,200	237.71%	4.14%
Glendale	46,000	54.44%	27,800	21.30%	31,900	20.15%	105,700	125.09%	2.74%
Goodyear	17,000	122.30%	35,900	116.18%	39,000	58.38%	91,900	661.15%	7.00%
Guadalupe	1,000	166.67%	-	0.00%	200	12.50%	1,200	200.00%	3.73%
Litchfield Park	2,400	200.00%	1,000	27.78%	(300)	-6.52%	3,100	258.33%	4.35%
Mesa	68,600	39.88%	53,300	22.15%	24,200	8.23%	146,100	84.94%	2.07%
Paradise Valley	200	3.70%	300	5.36%	-	0.00%	500	9.26%	0.30%
Peoria*	22,900	80.63%	36,100	70.37%	54,100	61.90%	113,100	398.24%	5.50%
Phoenix	159,100	21.47%	193,100	21.45%	170,900	15.63%	523,100	70.59%	1.80%
Queen Creek*	4,700	276.47%	13,400	209.38%	17,000	85.86%	35,100	2064.71%	10.79%
Salt River	500	6.85%	1,300	16.67%	10,500	115.38%	12,300	168.49%	3.35%
Scottsdale	29,200	19.20%	24,600	13.57%	8,900	4.32%	62,700	41.22%	1.16%
Surprise	19,100	212.22%	22,900	81.49%	67,400	132.16%	109,400	1215.56%	8.97%
Tempe	29,000	17.86%	36,100	18.86%	13,600	5.98%	78,700	48.46%	1.33%
Tolleson	3,200	25.00%	4,300	26.88%	10,600	52.22%	18,100	141.41%	2.98%
Wickenburg	800	19.51%	1,100	22.45%	5,600	93.33%	7,500	182.93%	3.53%
Youngtown	500	41.67%	(100)	-5.88%	100	6.25%	500	41.67%	1.17%
TOTAL	547,100	34.96%	593,200	28.09%	671,900	24.84%	1,812,200	115.80%	2.60%

Source: Maricopa Association of Governments, Interim Projections, June 25, 2003

Notes:

Because construction employment follows development, employment projections may show declines in future years.

*These projections include the Maricopa County portion of Peoria, Queen Creek and the Gila River Indian Community only.

MPA numbers rounded to nearest 100. County numbers may not add due to rounding.

Please refer to Caveats for Interim Projections for complete notation on this series.

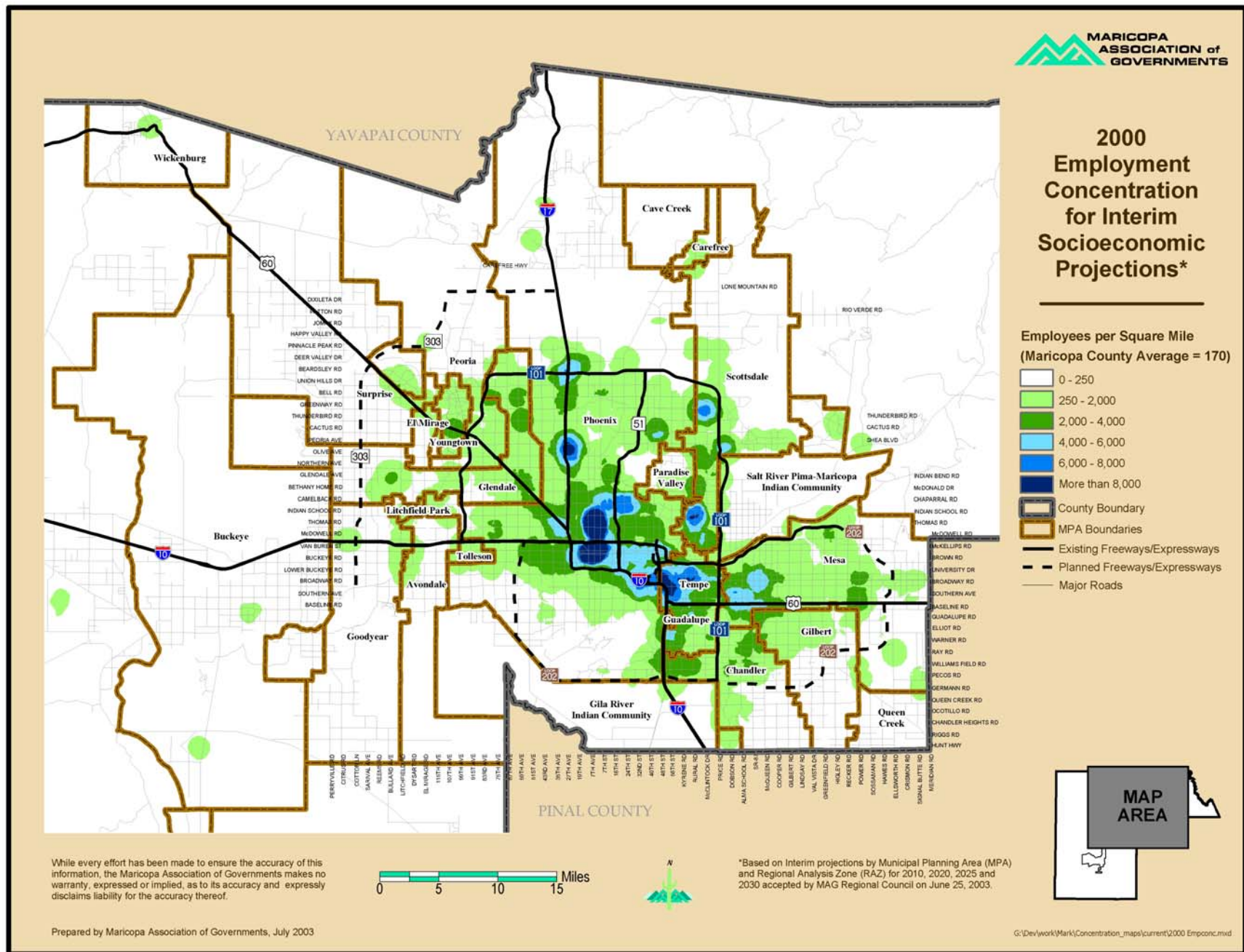


Figure 4-18: Employment Concentration (2000)

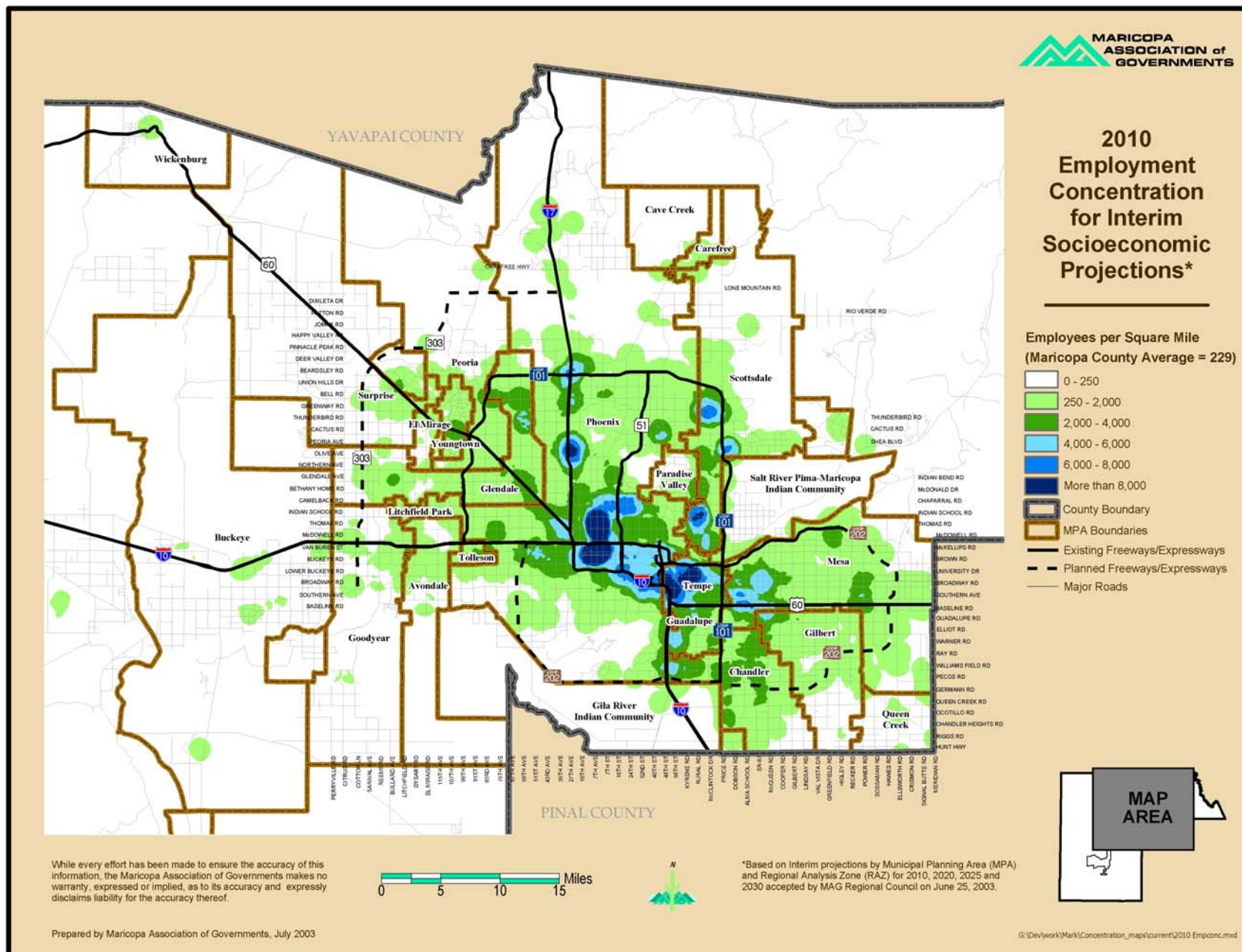


Figure 4-19: Employment Concentration (2010)

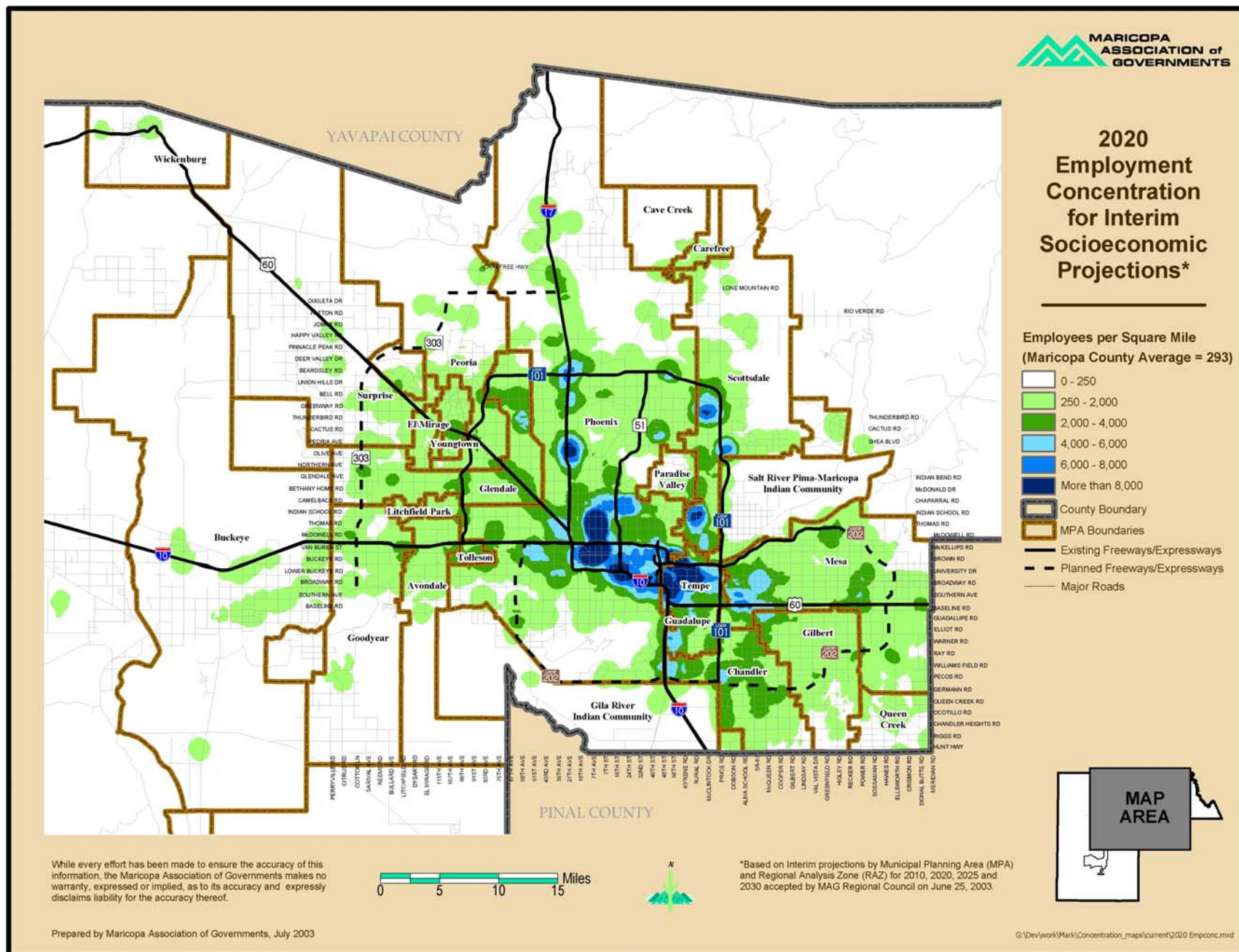


Figure 4-20: Employment Concentration (2020)

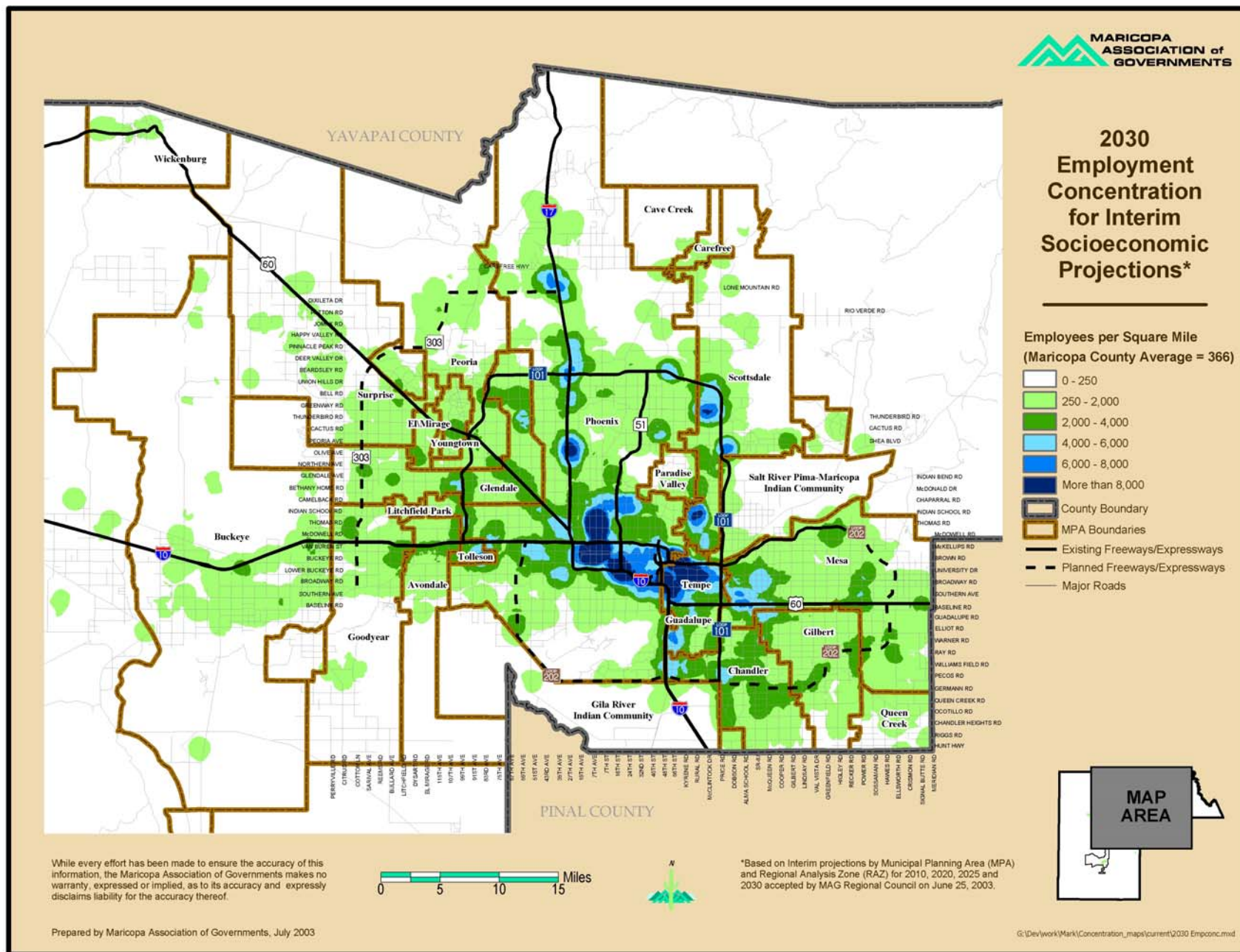


Figure 4-21: Employment Concentration (2030)

Job Housing Balance and Urban Concentration

Job housing balance is defined as the ratio of jobs to households (occupied housing units) in an area. The pattern of job housing balance shows those areas that are job-rich and those that are job-poor. Extremes in either direction create a higher need for commuting from residences to workplace.

Job housing balance by MPA is presented in Tables 4-13 and 4-14. Table 4-13 shows the projected trend by MPA, while Table 4-14 displays the rank order by decade. Overall, job housing balance in Maricopa County increases from 1.37 jobs per household in 2000 to 1.42 in 2010, 1.48 in 2020, and 1.58 in 2030 (Table 4-13).

In 2000, there are 9 MPAs with higher job housing balance than the county average - in rank order - Tolleson, the Gila River Indian Community, the Salt River Pima-Maricopa Indian Community, Tempe, Goodyear, Scottsdale, Phoenix, Buckeye, and Gila Bend (Table 4-13). By 2030, there are 10 MPAs with higher job housing balance than the county average - in rank order - Tolleson, the Salt River Pima-Maricopa Indian Community, the Gila River Indian Community, Tempe, El Mirage, Gila Bend, Glendale, Chandler, Scottsdale, and Phoenix.

Figures 4-22 through 4-25 are maps that show jobs housing balance by Regional Analysis Zone (RAZ) for 2000, 2010, 2020, and 2030 respectively.

In 2000, the primarily residential areas of Greater Phoenix include much of the West Valley, the Northeast Valley and the far Southeast Valley. Job-rich areas tend to follow the regional freeway system, and are concentrated in two generally central areas north and south of the Salt River, with some exceptions in the west and north of the metro area. By 2010, there is greater job housing balance in the Southwest Valley along I-10 as well.

By 2020, the Southwest Valley along I-10 and the Southeast Valley are projected to have more job-rich areas. Additionally, there are more job-rich areas in the northern part of the metro area, both north central and northwest. Both of these trends continue into 2030.

Figures 4-26 through 4-29 display urban concentration for Maricopa County for 2000, 2010, 2020, and 2030. Urban concentration displays a combination of both population and employment concentrations. It helps in visualizing the concentration of all development.

**Table 4-13: Jobs Housing Balance by Municipal Planning Area (MPA), Maricopa County
July 1, 2000 and Interim Projections July 1, 2010 to July 1, 2030**

Municipal Planning Area (MPA)	Jobs per Household 2000	Jobs per Household 2010	Jobs per Household 2020	Jobs per Household 2030
Avondale	0.80	0.90	1.42	1.38
Buckeye	1.51	1.42	1.29	1.55
Carefree	1.07	1.42	1.39	1.39
Cave Creek	0.50	0.86	0.88	0.70
Chandler	1.08	1.44	1.62	1.78
County Areas	0.67	0.67	0.66	0.83
El Mirage	0.79	0.52	1.06	2.68
Fountain Hills	0.49	0.73	0.70	0.66
Gila Bend	1.50	2.11	1.40	1.95
Gila River*	6.17	6.86	6.70	7.25
Gilbert	0.92	1.08	1.11	1.28
Glendale	1.06	1.31	1.51	1.81
Goodyear	1.99	1.41	1.18	0.94
Guadalupe	0.55	1.23	1.23	1.38
Litchfield Park	0.80	1.29	0.84	0.75
Mesa	1.04	1.23	1.36	1.44
Paradise Valley	1.04	1.00	1.02	1.00
Peoria*	0.69	0.90	1.20	1.56
Phoenix	1.56	1.52	1.55	1.67
Queen Creek*	0.81	1.16	1.16	1.43
Salt River	3.65	3.39	3.96	8.52
Scottsdale	1.66	1.69	1.70	1.74
Surprise	0.60	0.64	0.65	0.84
Tempe	2.55	2.87	3.24	3.34
Tolleson	9.14	8.89	11.28	17.17
Wickenburg	1.21	1.40	1.33	1.49
Youngtown	0.75	0.68	0.59	0.63
TOTAL	1.37	1.42	1.48	1.58

Source: Maricopa Association of Governments, Interim Projections, June 25, 2003

Notes:

*These projections include the Maricopa County portion of Peoria, Queen Creek and the Gila River Indian Community only.

Please refer to Caveats for Interim Projections for complete notation on this series.

**Table 4-14: Job Housing Balance Rank Order by Municipal Planning Area (MPA)
Maricopa County (2000-2030)**

Rank	Municipal Planning Area (MPA)	Jobs per Household 2000	Rank	Municipal Planning Area (MPA)	Jobs per Household 2010	Rank	Municipal Planning Area (MPA)	Jobs per Household 2020	Rank	Municipal Planning Area (MPA)	Jobs per Household 2030
1	Tolleson	9.14	1	Tolleson	8.89	1	Tolleson	11.28	1	Tolleson	17.17
2	Gila River*	6.17	2	Gila River*	6.86	2	Gila River*	6.70	2	Salt River	8.52
3	Salt River	3.65	3	Salt River	3.39	3	Salt River	3.96	3	Gila River*	7.25
4	Tempe	2.55	4	Tempe	2.87	4	Tempe	3.24	4	Tempe	3.34
5	Goodyear	1.99	5	Gila Bend	2.11	5	Scottsdale	1.70	5	El Mirage	2.68
6	Scottsdale	1.66	6	Scottsdale	1.69	6	Chandler	1.62	6	Gila Bend	1.95
7	Phoenix	1.56	7	Phoenix	1.52	7	Phoenix	1.55	7	Glendale	1.81
8	Buckeye	1.51	8	Chandler	1.44	8	Glendale	1.51	8	Chandler	1.78
9	Gila Bend	1.50	9	Buckeye	1.42	9	Avondale	1.42	9	Scottsdale	1.74
10	Wickenburg	1.21	10	Carefree	1.42	10	Gila Bend	1.40	10	Phoenix	1.67
11	Chandler	1.08	11	Goodyear	1.41	11	Carefree	1.39	11	Peoria*	1.56
12	Carefree	1.07	12	Wickenburg	1.40	12	Mesa	1.36	12	Buckeye	1.55
13	Glendale	1.06	13	Glendale	1.31	13	Wickenburg	1.33	13	Wickenburg	1.49
14	Paradise Valley	1.04	14	Litchfield Park	1.29	14	Buckeye	1.29	14	Mesa	1.44
15	Mesa	1.04	15	Guadalupe	1.23	15	Guadalupe	1.23	15	Queen Creek*	1.43
16	Gilbert	0.92	16	Mesa	1.23	16	Peoria*	1.20	16	Carefree	1.39
17	Queen Creek*	0.81	17	Queen Creek*	1.16	17	Goodyear	1.18	17	Avondale	1.38
18	Litchfield Park	0.80	18	Gilbert	1.08	18	Queen Creek*	1.16	18	Guadalupe	1.38
19	Avondale	0.80	19	Paradise Valley	1.00	19	Gilbert	1.11	19	Gilbert	1.28
20	El Mirage	0.79	20	Avondale	0.90	20	El Mirage	1.06	20	Paradise Valley	1.00
21	Youngtown	0.75	21	Peoria*	0.90	21	Paradise Valley	1.02	21	Goodyear	0.94
22	Peoria*	0.69	22	Cave Creek	0.86	22	Cave Creek	0.88	22	Surprise	0.84
23	County Areas	0.67	23	Fountain Hills	0.73	23	Litchfield Park	0.84	23	County Areas	0.83
24	Surprise	0.60	24	Youngtown	0.68	24	Fountain Hills	0.70	24	Litchfield Park	0.75
25	Guadalupe	0.55	25	County Areas	0.67	25	County Areas	0.66	25	Cave Creek	0.70
26	Cave Creek	0.50	26	Surprise	0.64	26	Surprise	0.65	26	Fountain Hills	0.66
27	Fountain Hills	0.49	27	El Mirage	0.52	27	Youngtown	0.59	27	Youngtown	0.63

Source: Maricopa Association of Governments, Interim Projections, June 25, 2003

Notes:

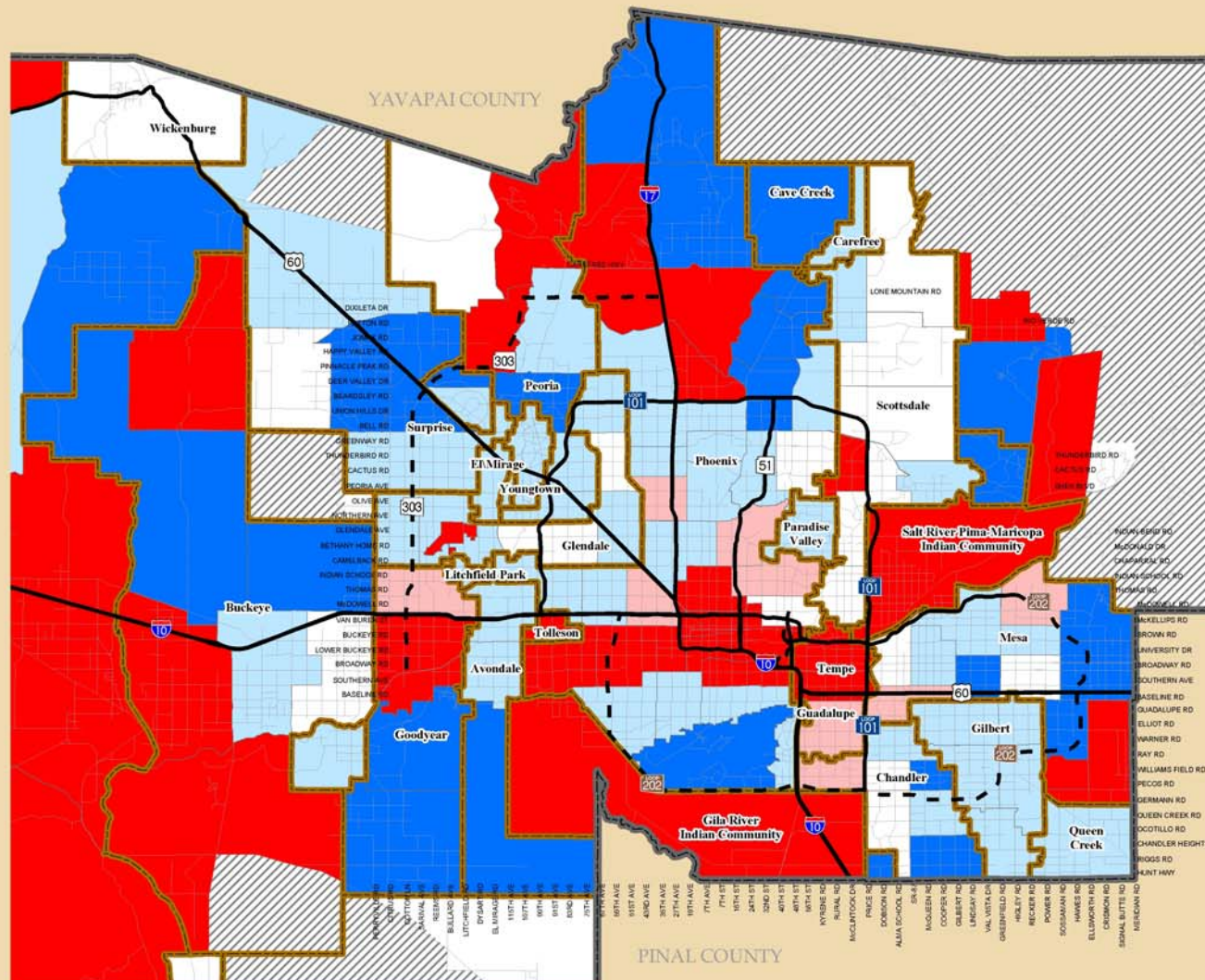
*These projections include the Maricopa County portion of Peoria, Queen Creek and the Gila River Indian Community only.

Please refer to Caveats for Interim Projections for complete notation on this series.

2000 Job Housing Balance for Interim Socioeconomic Projections*

Jobs per Household
(Maricopa County Average = 1.37)

- Less than 40% of County Average
- 40% - 80% of County Average
- 80% - 120% of County Average
- 120% - 160% of County Average
- More than 160% of County Average
- Insufficient Data*
- County Boundary
- MPA Boundaries
- Existing Freeways/Expressways
- Planned Freeways/Expressways
- Major Roads



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Prepared by Maricopa Association of Governments, July 2003

0 5 10 15 Miles



*Based on Interim projections by Municipal Planning Area (MPA) and Regional Analysis Zone (RAZ) for 2010, 2020, 2025 and 2030 accepted by MAG Regional Council on June 25, 2003.

*Insufficient Data indicates large sample areas of low population and employment density.



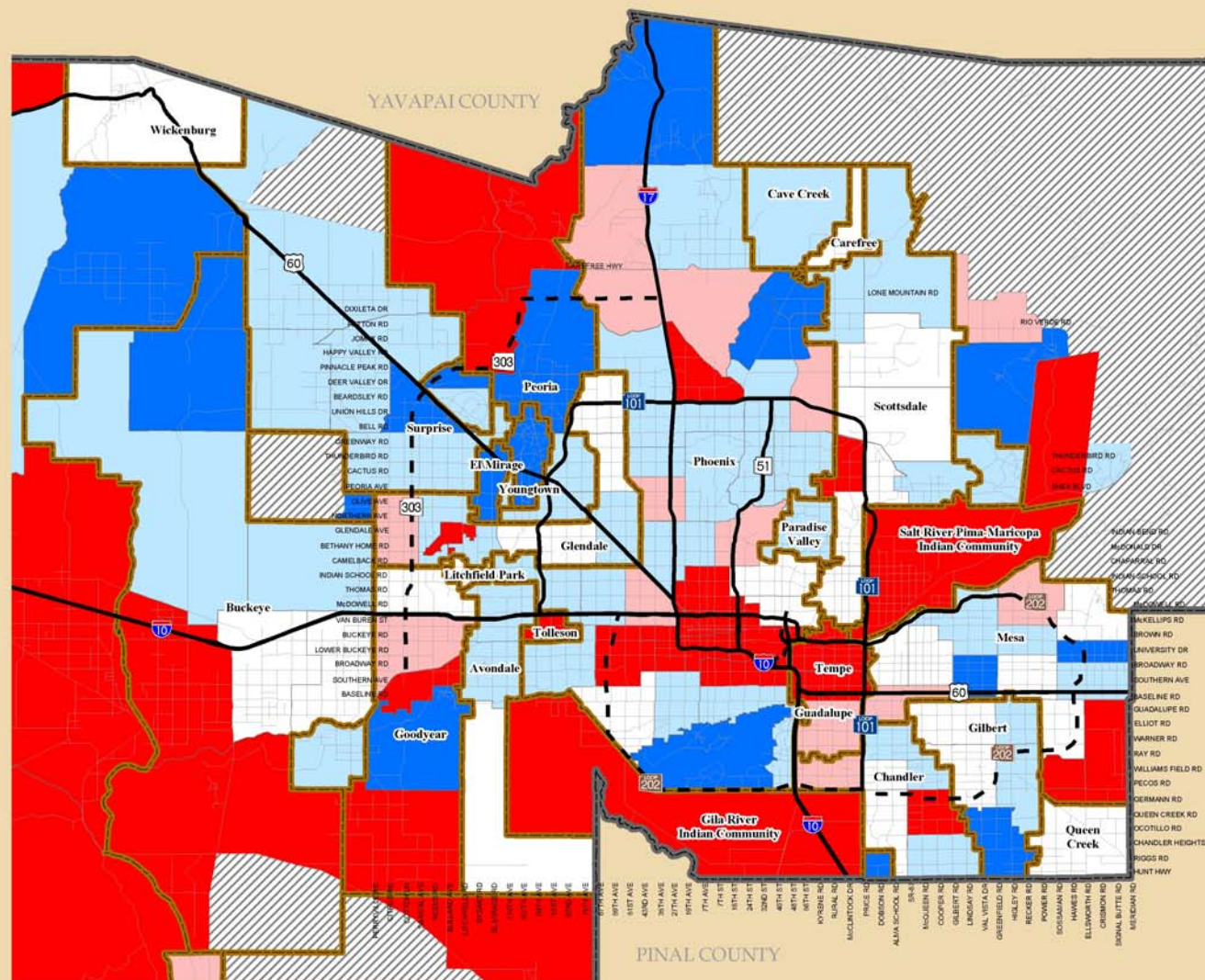
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Figure 4-22: Job Housing Balance (2000)

2010 Job Housing Balance for Interim Socioeconomic Projections*

Jobs per Household
(Maricopa County Average = 1.42)

- Less than 40% of County Average
- 40% - 80% of County Average
- 80% - 120% of County Average
- 120% - 160% of County Average
- More than 160% of County Average
- Insufficient Data*
- County Boundary
- MPA Boundaries
- Existing Freeways/Expressways
- Planned Freeways/Expressways
- Major Roads



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Prepared by Maricopa Association of Governments, July 2003

0 5 10 15 Miles



*Based on Interim projections by Municipal Planning Area (MPA) and Regional Analysis Zone (RAZ) for 2010, 2020, 2025 and 2030 accepted by MAG Regional Council on June 25, 2003.

*Insufficient Data indicates large sample areas of low population and employment density.



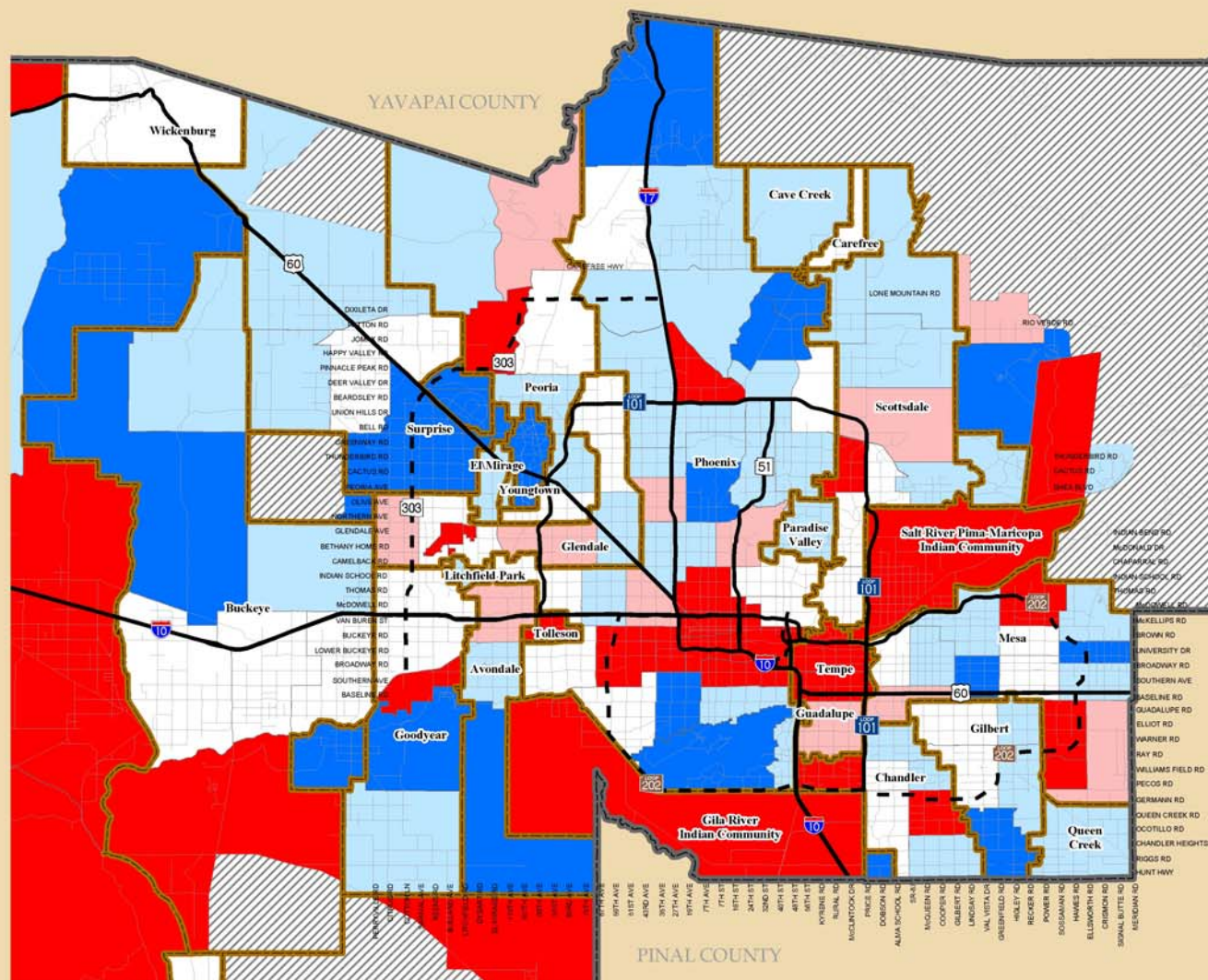
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Figure 4-23: Job Housing Balance (2010)

2020 Job Housing Balance for Interim Socioeconomic Projections*

Jobs per Household
(Maricopa County Average = 1.48)

- Less than 40% of County Average
- 40% - 80% of County Average
- 80% - 120% of County Average
- 120% - 160% of County Average
- More than 160% of County Average
- Insufficient Data*
- County Boundary
- MPA Boundaries
- Existing Freeways/Expressways
- Planned Freeways/Expressways
- Major Roads



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0 5 10 15 Miles



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*Insufficient Data indicates large sample areas of low population and employment density.



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Figure 4-24: Job Housing Balance (2020)

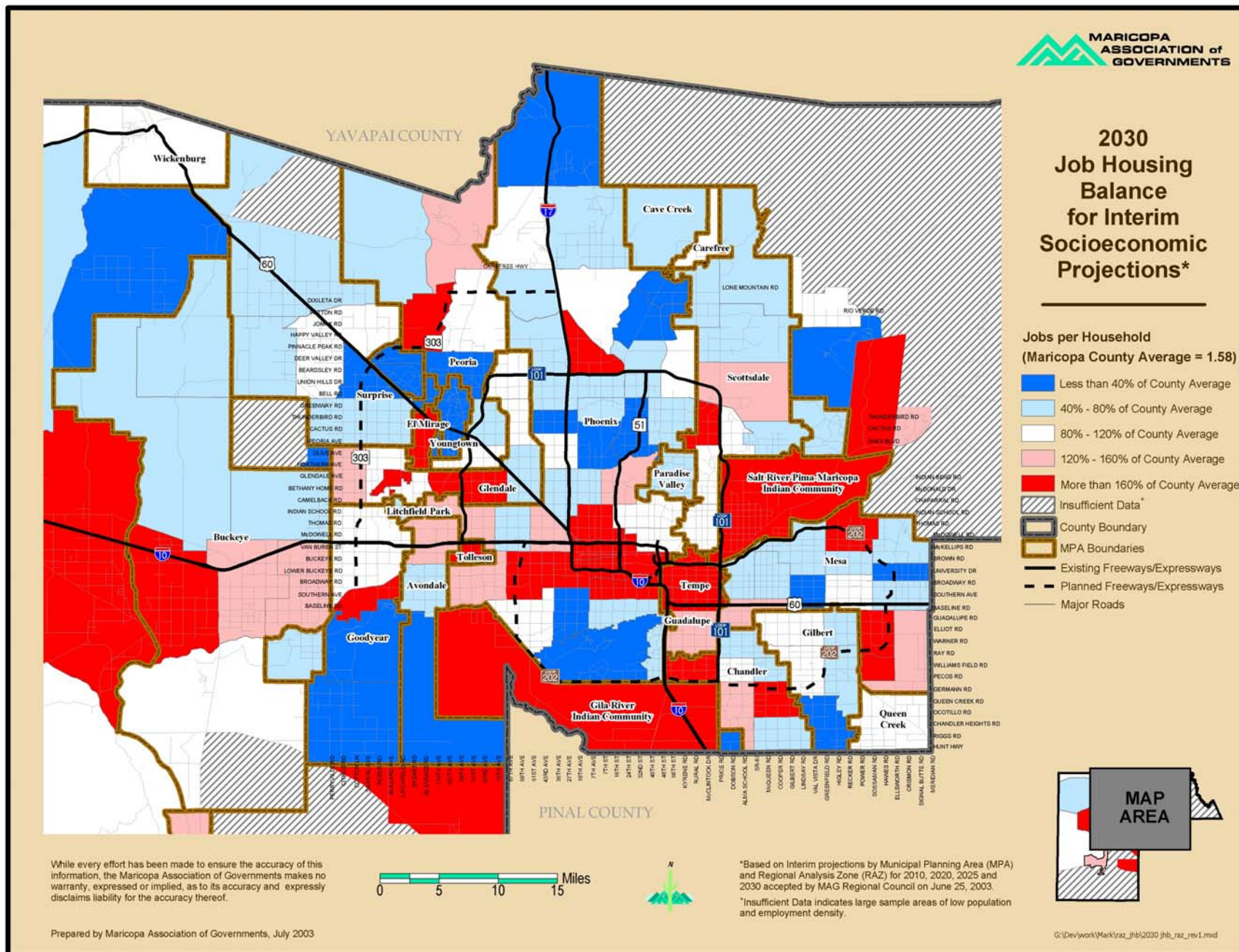


Figure 4-25: Job Housing Balance (2030)

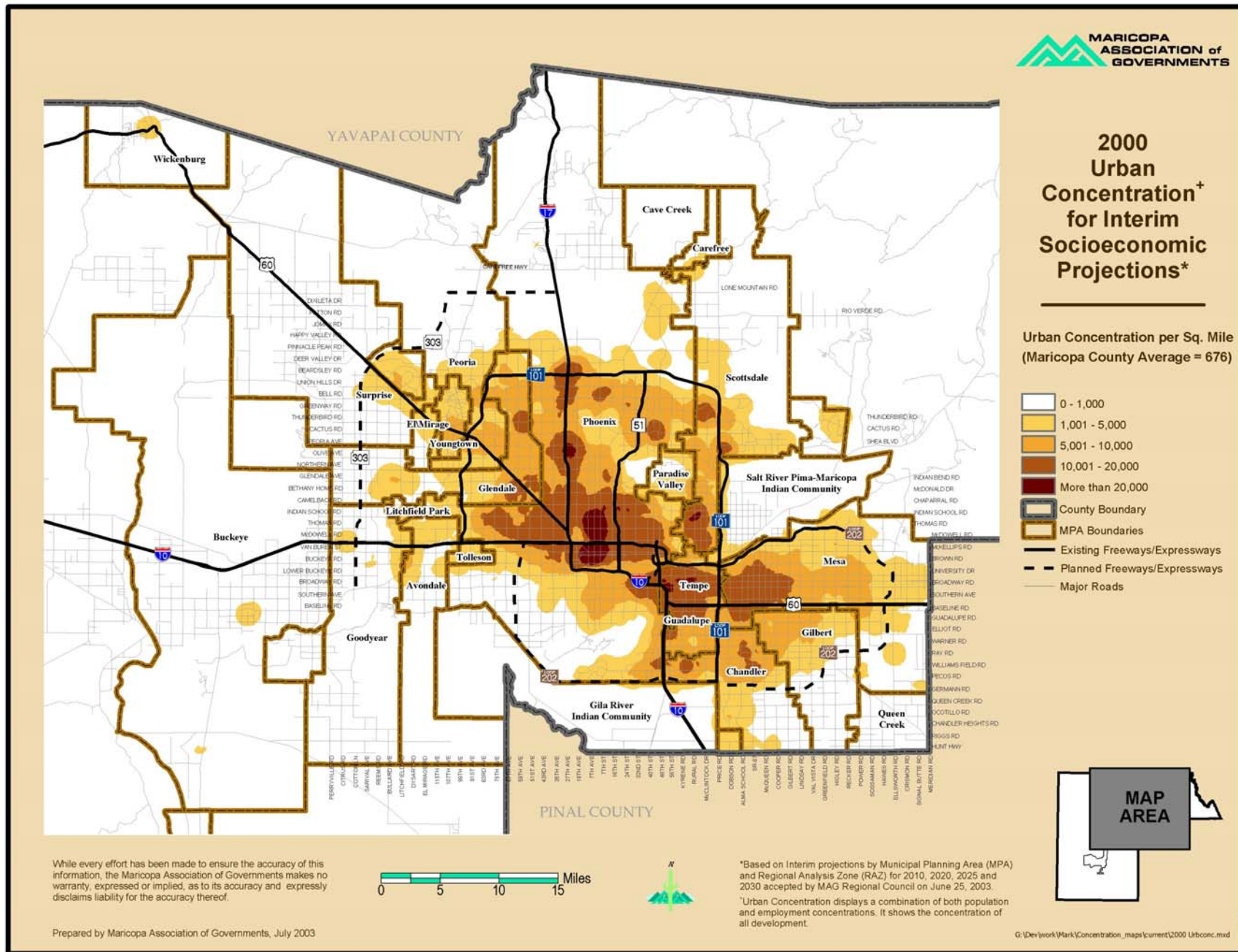
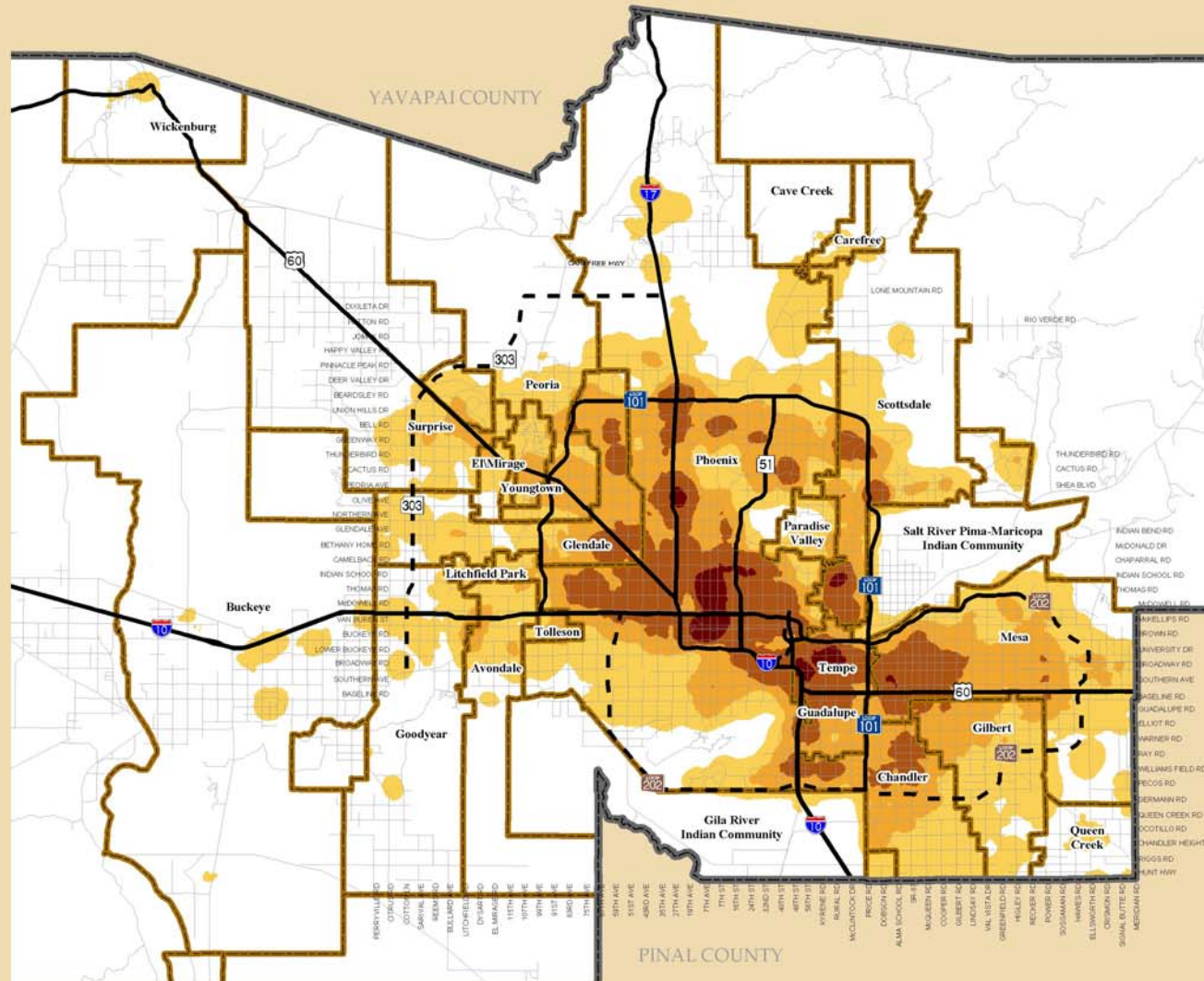


Figure 4-26: Urban Concentration (2000)

2010 Urban Concentration⁺ for Interim Socioeconomic Projections*

Urban Concentration per Sq. Mile
(Maricopa County Average = 906)

- 0 - 1,000
- 1,001 - 5,000
- 5,001 - 10,000
- 10,001 - 20,000
- More than 20,000
- County Boundary
- MPA Boundaries
- Existing Freeways/Expressways
- Planned Freeways/Expressways
- Major Roads



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*Based on Interim projections by Municipal Planning Area (MPA) and Regional Analysis Zone (RAZ) for 2010, 2020, 2025 and 2030 accepted by MAG Regional Council on June 25, 2003.

*Urban Concentration displays a combination of both population and employment concentrations. It shows the concentration of all development.

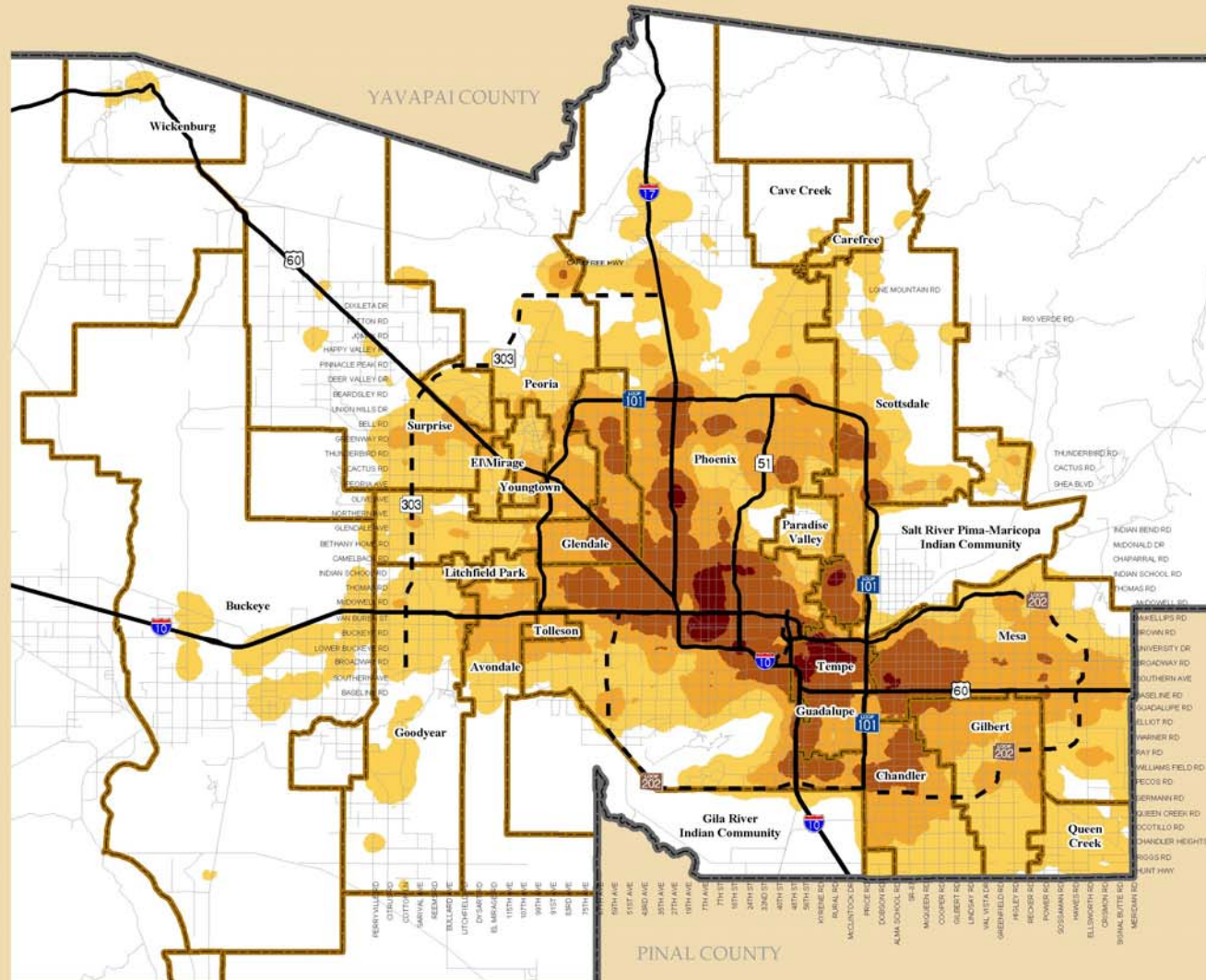


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Figure 4-27: Urban Concentration (2010)

2020 Urban Concentration⁺ for Interim Socioeconomic Projections^{*}

Urban Concentration per Sq. Mile
(Maricopa County Average = 1146)



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⁺Urban Concentration displays a combination of both population and employment concentrations. It shows the concentration of all development.

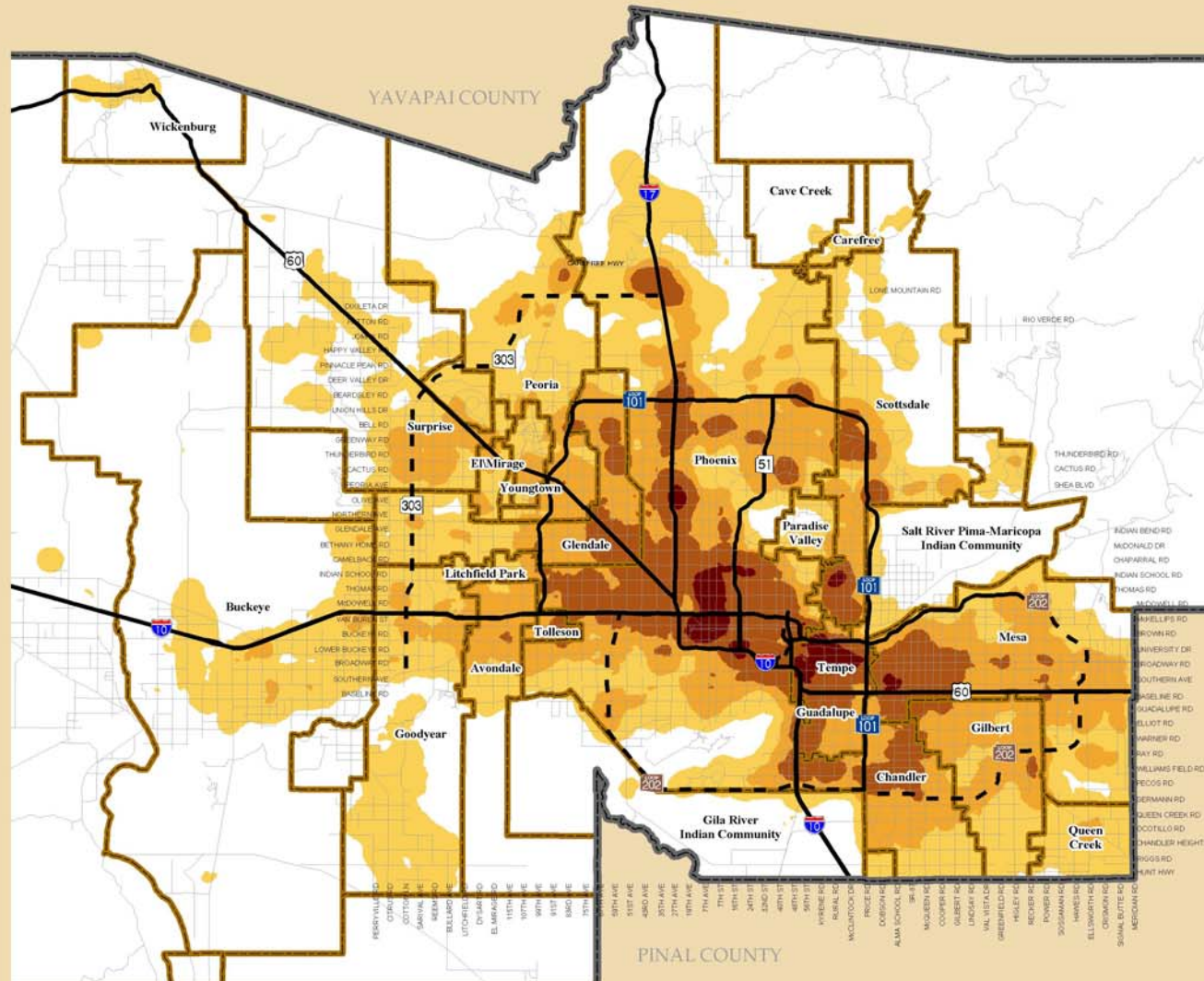


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Figure 4-28: Urban Concentration (2020)

2030 Urban Concentration* for Interim Socioeconomic Projections*

Urban Concentration per Sq. Mile
(Maricopa County Average = 1398)



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*Urban Concentration displays a combination of both population and employment concentrations. It shows the concentration of all development.



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Figure 4-29: Urban Concentration (2030)

Part II INFRASTRUCTURE

The need for infrastructure development to keep pace with regional growth is essential to the maintenance of the quality of life in the Phoenix metro area. Part II summarizes existing and future conditions for regional infrastructure systems.

5. Regional Transportation

This chapter of the GSIP final report will highlight issues and challenges that will face the region, as well as local municipalities, relative to future transportation system capacity and performance. Information for this report is derived from the Regional Transportation Plan (RTP) and a variety of supporting studies and background reports as noted.

As the MPO, MAG is a transportation policy-making organization. In accordance with federal legislation, the MAG region has also been designated as a Transportation Management Area (TMA), as it has a population of over 200,000. MPO's are required to ensure that existing and future expenditures for transportation projects and programs are based on a comprehensive, cooperative, and continuing planning process. Federal funding for transportation projects and programs are channeled through this planning process in cooperation with ADOT and the Regional Public Transportation Authority (RPTA)/Valley Metro.

MAG is governed by the Regional Council, which includes the top elected officials of each of its 28 member agencies and two representatives from the Arizona State Transportation Board. In addition to numerous other programs, MAG's two core functions are air quality and transportation planning. MAG staff, as well as numerous committees and task forces, provide analysis and input to the Regional Council.

The MAG Management Committee and four MAG policy committees report directly to the Regional Council. In addition to the policy committees, MAG has 20 technical committees, many of which address transportation issues. The following are the policy and technical committees that address transportation issues:

- *Transportation Policy Committee*
- *Transportation Review Committee*
- *Regional Aviation System Plan Policy Committee*
- *Enhancement Funds Working Group*
- *Intelligent Transportation System Committee*
- *Regional Bicycle Task Force*
- *Pedestrian Working Group*
- *Street Committee*

5.1 Overview of Metropolitan Transportation Planning

Transportation planning is a collaborative process, led by MAG and other key stakeholders including ADOT and Valley Metro. The process is designed to foster involvement by all interested parties including the business community, environmental organizations, community groups and the general public, through a proactive public participation process.

The Phoenix metropolitan area has been developing regional transportation plans since 1960. With the passage of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), MAG and local governments were given greater responsibility, flexibility and funding. These region planning responsibilities were strengthened under the legislation that replaced ISTEA, the Transportation Equity Act for the 21st Century (TEA-21), approved in 1998 and due for

reauthorization in 2003. The current reauthorization process, known as the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA) is underway. Central themes in SAFETEA include improving highway safety, timely completion of projects, environmental protection, and increased funding flexibility.

Regional Transportation Plan

The Regional Transportation Plan (RTP) is the most significant transportation planning effort in the Maricopa region in over 40 years, and the most comprehensive planning effort ever. Initiated in 2000 and nearing completion, the RTP employs a comprehensive planning process including extensive public involvement and an evaluation of transportation needs and the costs and impacts of alternative modeling scenarios.

Led by the regional Transportation Planning Committee (TPC), the RTP is a major planning initiative that will result in a broad vision for the regional transportation system to accommodate the growth expected over the next several decades. It will provide a new policy framework to guide regional transportation investments and establish performance measures for regional transportation facilities and services that allow better monitoring of system performance while facilitating system improvements in the future. The RTP will identify and prioritize specific transportation facilities needed to keep up with increasing travel demands in the region.

Long Range Transportation Plan

The MAG Long Range Transportation Plan (LRTP) 2002 Update is a product of a region-wide planning process, addressing all modes of surface transportation serving the region. The LRTP is based upon a financial element that identifies a trend funding strategy for needed transportation improvements. The Plan is usually updated each year and has a 20-year time horizon. The LRTP, however, will be incorporated in the ongoing Regional Transportation Plan process.

Transportation Improvement Program

The MAG Transportation Improvement Program (TIP) is a financially constrained transportation project plan that is prepared annually. The TIP serves as a five-year regional guide for the preservation, management and expansion of public transportation services including highways, arterial streets, transit, demand management and alternative mode improvements in Maricopa County. MAG, in cooperation with the Arizona Department of Transportation (ADOT) and the Regional Public Transportation Authority (RPTA/Valley Metro), is responsible for the development of the TIP.

Regional Aviation

Federal regulations call for the Metropolitan Planning Organizations (MPO's) to sponsor regional aviation system planning in the metropolitan area with the objective of meeting the long term air transportation needs of the public in a safe and efficient manner. MAG was designated the MPO for the Phoenix region in 1974 and has conducted regional aviation system planning since 1997. MAG members own and operate the region's airports.

The MAG Regional Aviation System Plan Policy Committee members include elected officials from the cities and towns in the Phoenix metropolitan area, the state, the federal government (including the military) and the Gila River Indian Community. This committee is responsible for providing policy input and guidance to the development of the MAG Regional Aviation System Plan (RASP) and related aviation studies. Users of the aviation system and the public in general are also invited to all meetings and have an opportunity to offer input.

5.2 Existing & Planned Surface Transportation System

The Phoenix metropolitan area is served by an extensive base system of surface roadways, rail lines, bicycle trails and pedestrian facilities. This base network includes:

- 2,211 freeway lane miles;
- 11,952 street lane miles;
- 2,559 miles of local bus service;
- 465 miles of express and commuter bus service; and
- No commuter rail or light rail service.

As a result of travel demand created by substantial growth across the valley, the regional surface network described above will need to be expanded. Some of the planned expansions from the Regional Transportation Plan over the next 20 years include¹:

- 37 percent increase in freeway/expressway lane-miles;
- 40 percent increase in street lane miles;
- a tripling of local bus service;
- a quadrupling of express and commuter bus service; and
- 57-mile light rail transit system.

Highway System

Figure 5-1 illustrates the regional roadway network serving the Maricopa region including freeways, expressways and highways.

Freeways/Expressways

Under Federal legislation, MAG is responsible for developing freeway plans for the region and the Arizona Department of Transportation (ADOT) is responsible for constructing and maintaining freeways and expressways. The region is currently served by nearly 175 miles of freeway that will be expanded to 225 miles by 2007. Table 5-1 lists existing and planned mileages for the region's freeways and expressways. Historically, the Maricopa, Papago, Black Canyon and Superstition freeways formed the backbone of the region's system. The addition of the Agua Fria, Squaw Peak, Pima, Price Red Mountain freeways has substantially expanded service in the region.

¹ MAG Regional Transportation Plan, Base Network

**Table 5-1
Centerline Miles for New Freeways²**

Corridor	Existing Miles	Planned Miles	Total Miles
Agua Fria	22	1.4	23.4
Grand Expressway	0	12	12
Estrella Expressway	0	27.3	27.3
Hohokam Expressway	3.1	0	3.1
Pima Freeway	26.1	2.1	28.2
Price Freeway	9.4	0.5	9.9
Red Mountain Freeway	16.5	14.4	30.9
Santan Freeway	0	24	24
Sky Harbor Facilities	2.4	0.9	3.3
South Mountain Parkway	0	23	23
Squaw Peak Parkway	8	2.2	10.2
TOTAL	87.5	107.8	195.3

Arterials

The arterial street system consists primarily of paved roadways with four or more lanes on a mile grid system in the Valley. It is expected that this system will expand by a combination of new roadway construction, the paving of dirt roads on the mile grid system and the widening of existing arterial streets. Currently there are over 8,500 lane miles of arterial streets. Over the next twenty years, this number is expected to increase 40%.

Mass Transit System

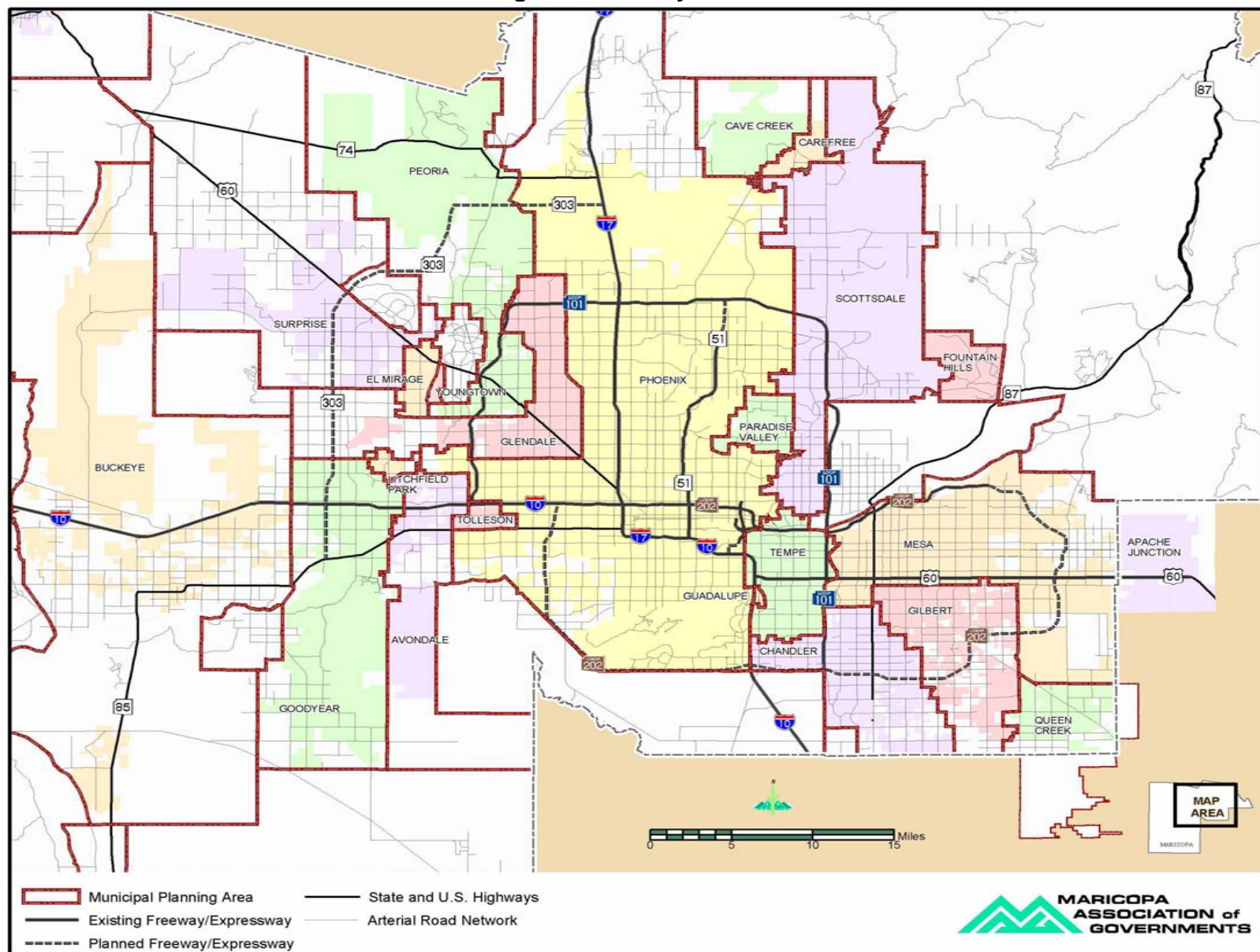
The two primary components of the region's transit system are local transit services and region-serving, high capacity transit, including commuter rail, light rail transit and bus rapid transit. MAG has official responsibility for developing the Regional Transit Plan and integrating it into regional, long range-transportation plans.

Regional Public Transit Authority (RPTA) – Valley Metro

In 1985, the Arizona Legislature passed a law enabling the citizens of Maricopa County to vote on a sales tax increase to fund regional freeway improvements and to provide for the creation of the Regional Public Transportation Authority (RPTA). The RPTA was charged with developing a regional transit plan, finding a dedicated funding source for transit, and developing and operating a regional transit system. The RPTA's mission is to develop and promote a wide variety of alternative travel modes, including a starter light rail system. The RPTA also develops programs promoting flexible work hours, teleworking and teleconferencing.

² MAG Long Range Transportation Plan 2002 Update includes only new freeways and expressways funded with half-cent sales tax revenue; see LRTP for additional caveats and notes.

**Figure 5-1
Regional Roadway Network**



Local Transit

Local transit provides access to residents within a community. Local transit includes fixed routes that operate on an established route and a regular schedule. For example, Valley Metro currently operates fixed route transit in cities like Phoenix, Guadalupe, Glendale, Tempe, and others. Fixed routes are supplemented with shuttles in busy activity centers. The FLASH route in downtown Tempe is an example of an activity center shuttle. Local transit will also include circulators to provide mobility within neighborhoods. The ALEX is a successful neighborhood circulator in the Ahwatukee area.

Regional Transit System and High Capacity Transit

A comprehensive Regional Transit System will encourage mobility and independence for all residents of Maricopa Counties. A range of transit services is needed to meet the mobility needs for different markets and different communities. Figure 5-2 illustrates the Express Bus and Bus Rapid Transit plan for the region. Figure 5-3 identifies the light rail system as planned and potential corridors for extended service. New regional transit services will include regional connections to provide access between cities and activity centers in the Valley. Regional connections will operate at higher speeds with longer distances between stops to provide faster trips than local routes.

Transit in Local General Plans

Locally adopted general plans for many Maricopa County communities (Avondale, Gilbert, Glendale, Goodyear, Mesa, Phoenix and Tempe) envision mass transit service connections to the region. While Phoenix, Glendale, Tempe and Mesa will be served by the region's initial light rail system, Avondale, Gilbert, and Goodyear include expanded light rail or commuter rail service as a component of the future regional transportation system, citing opportunities created by existing rail corridors. Gila River Indian Community identifies an existing rail line as a potential future transit link with the region.

Adopted Plans in Cave Creek, Chandler, Fountain Hills, Gila Bend, Litchfield Park and Maricopa County include policy statements in support of expanded transit service across the region.

Additional Transit Services

The region is served by additional, specialized transit services including vanpools, paratransit and rural access transit.

Bicycle and Trails

In 1997, the Regional Bicycle Task Force (RBTF) undertook three critical tasks: 1) Address identified issues and needs in the form of refined regional goals and objectives, 2) develop maps of planned bicycle routes, including on-road and off-road regional bicycle facilities, 3) address criteria for selecting projects for funding, changes to the Congestion Management System and the RBTF rating system. These tasks are reflected in the **MAG Regional Bicycle Plan**.

Regional Bicycle Plan Maps

The MAG Regional Bikeway Plan routes were designed as a system of long, interconnected routes for use by the commuting, touring, recreational, or training bicyclist to travel within or through the Valley. The regional system forms the skeleton that serves a vital function by linking important regional destinations, providing links

between jurisdictions, and by reducing single-occupant vehicle trips to improve air quality and lessen traffic congestion. A variety of maps is included which document on-road (Figure 5-4) and off-street (Figure 5-5) bicycle facilities. MAG has produced ***Bike Ways - Metropolitan Phoenix Area***, a folding map for public distribution illustrating existing, locally-designated bicycling facilities including on-street and off-street bikeways and trails.

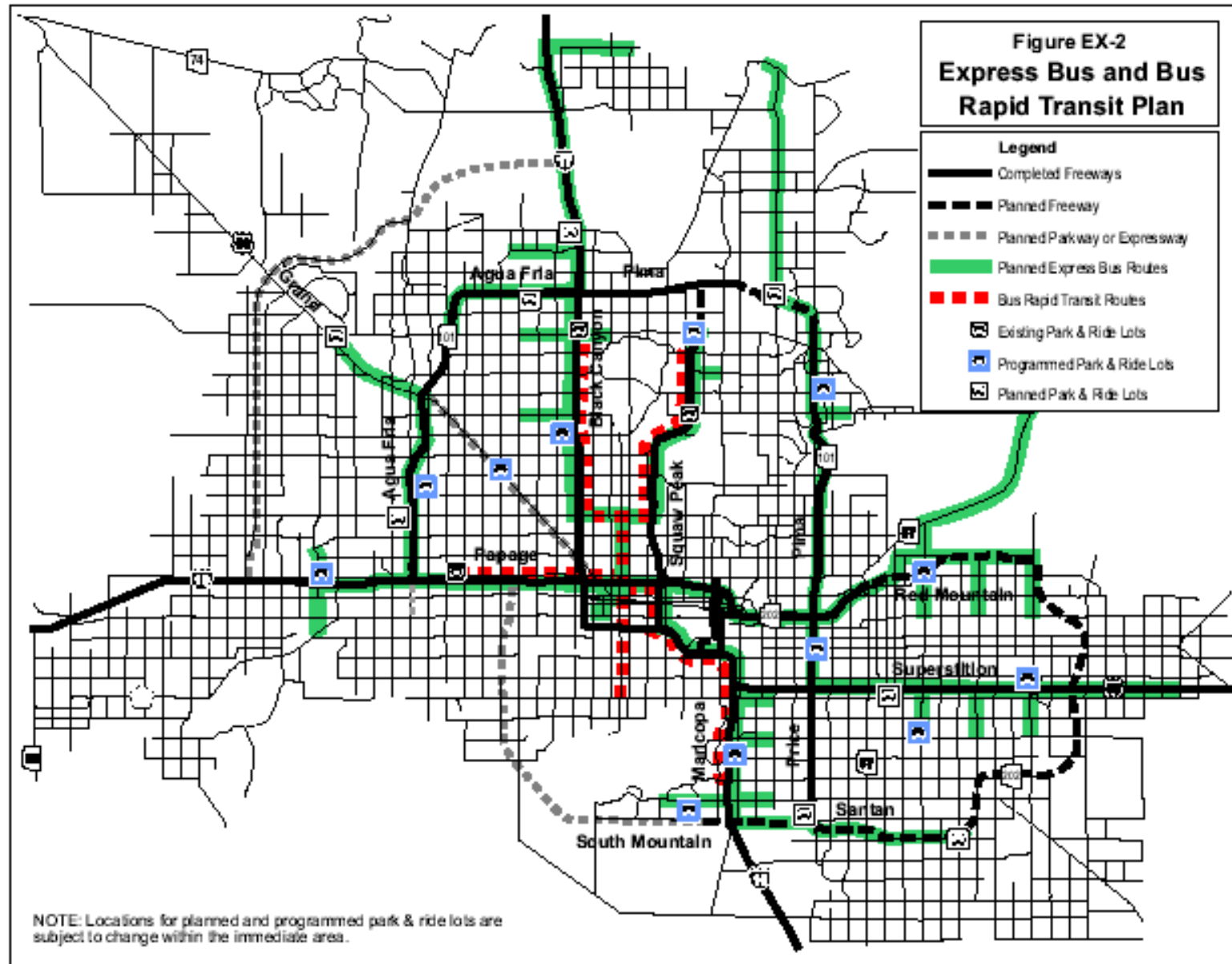
Regional Off-Street System Plan (ROSS)

The Regional Off-Street System (ROSS) Plan, prepared by MAG, identifies a region-wide system of off-street paths/trails for non-motorized transportation (Figure 5-5). Throughout the MAG region, numerous opportunities for off-street travel by people who walk and bike exist along areas such as canal banks, utility line easements and flood control channels. These types of rights-of-way and easements intersect many arterial streets where local daily destinations are typically located. The goal of the ROSS plan is to help make bicycling and walking viable options for daily travel trips using off-street opportunities.

Maricopa County Regional Trail System

The Phase I or pilot study for the program identified 221 miles of recommended trail alignments linking White Tank Mountain Regional Park, Lake Pleasant Regional Park, Spur Cross Ranch Conservation Area and Cave Creek Recreation Area as depicted in Chapter 8, Open Space. The system will capitalize on existing rights-of-way such as canals, parks, utility corridors, and flood control projects. As part of the ongoing program, the Maricopa County Trails Commission is developing partnerships with communities to help implement the trail system.

Figure 5-2
Express Bus and Rapid Transit Plan



**Figure 5-3
Light Rail Service**

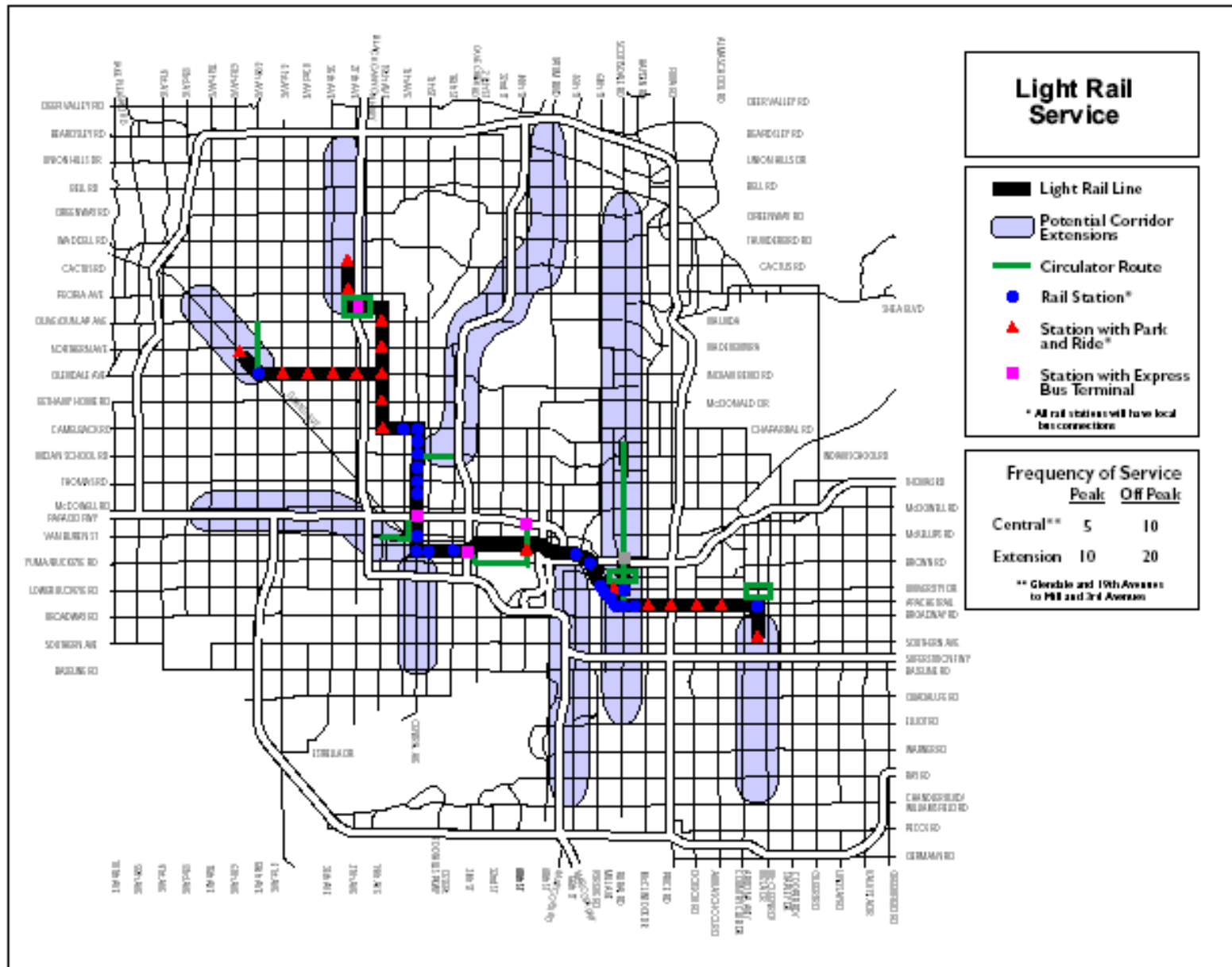


Figure 5-4
Regional On-Road Bike Lanes

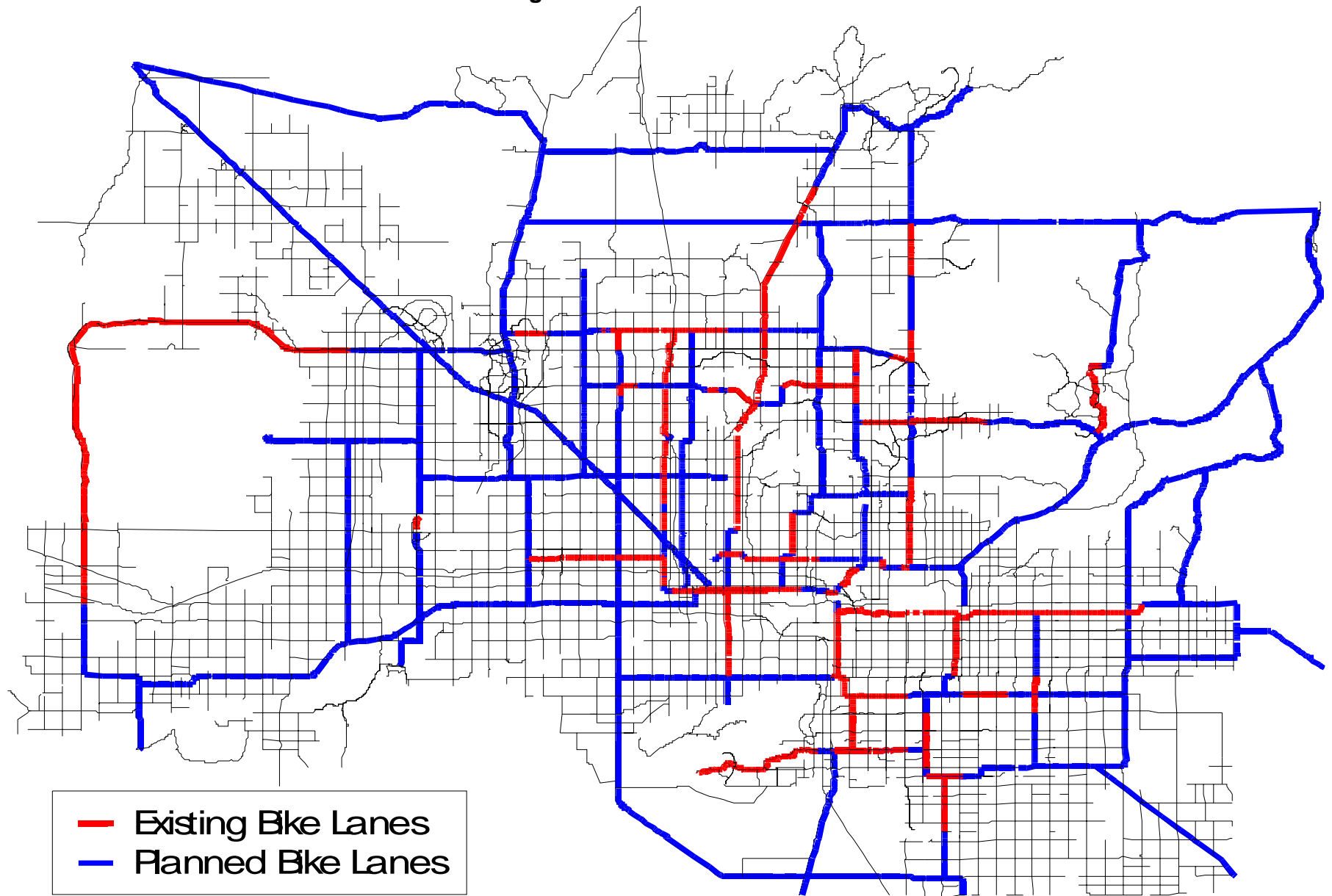
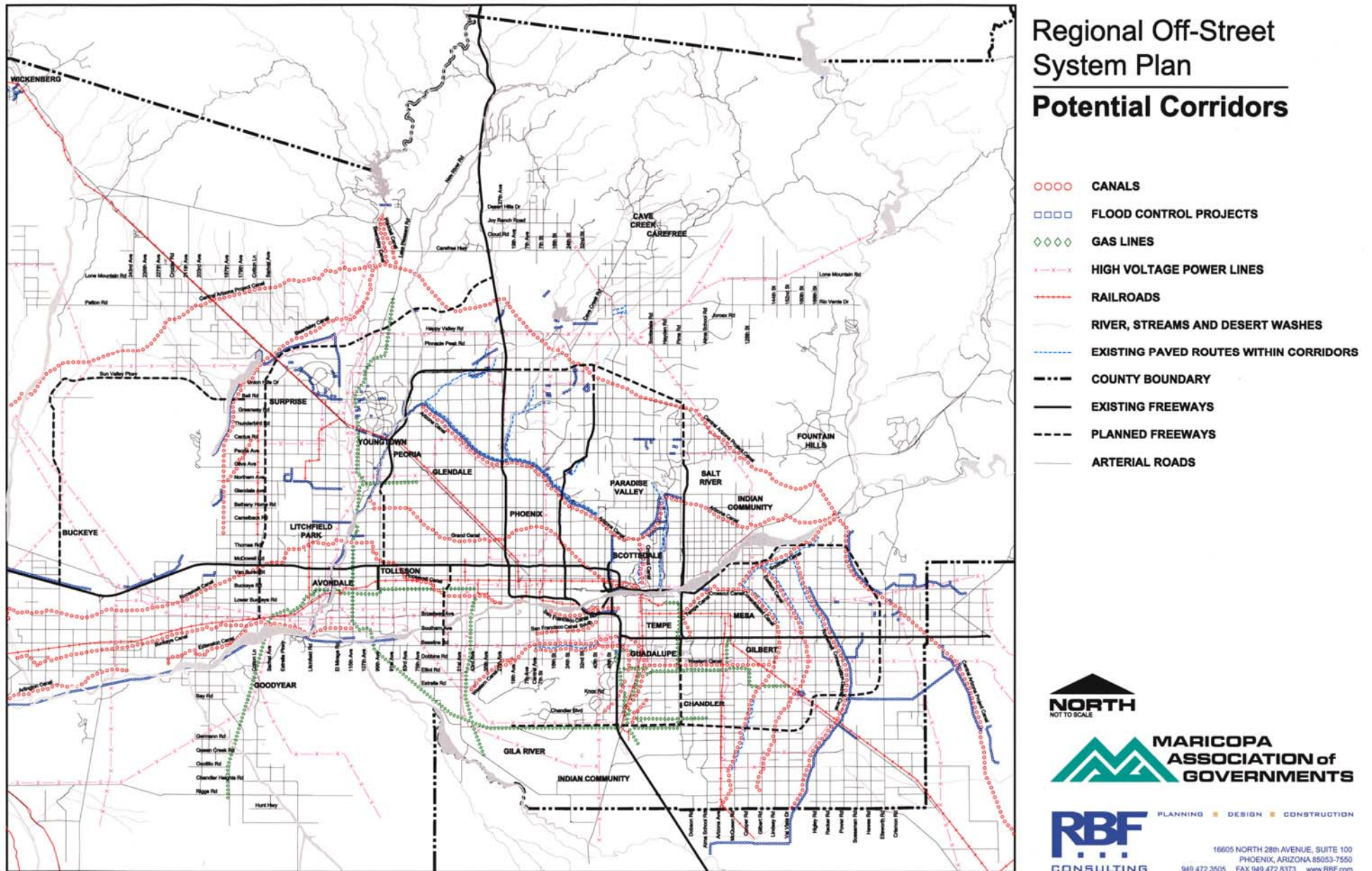


Figure 5-5



Pedestrian Facilities

Within the Phoenix metropolitan area, initiatives are under way to address pedestrian mobility: the creation of a regional system of urban trails for its recreation, health, and alternative transportation benefits; and the improvement of the pedestrian environment within the existing streetscape.

Primarily downtown improvement initiatives have embraced the need to create conformable and inviting environments. Examples are throughout the Valley and evident in Phoenix, Tempe, Glendale, Mesa, Peoria, Guadalupe, Scottsdale, and other jurisdictions. Sidewalks are being added, better street lighting is being provided, and amenities such as benches and drinking fountains, shade trees, artist-designed bus shelters have made pedestrian settings more enjoyable. Retrofitting existing sidewalks for ADA compliance is taking place. New development guidelines enacted by MAG member agencies have led to a substantial level of private investment in public walkways, traffic calming and street redesign.

Regional Pedestrian Planning

The **MAG Pedestrian Plan 2000** outlines programs and actions to encourage the development of pedestrian areas.³ The best practices methods of pedestrian design implemented through the **Pedestrian Design Assistance Program** are available to all MAG member agencies to help improve the environment for walking throughout the Region.

Pedestrian Plan 2000

The purpose of the MAG Pedestrian Plan 2000 is to identify and recommend programs and actions that guide and encourage the development of pedestrian areas and facilities and ultimately increase walking as a viable mode of transportation throughout the Region.

Roadway Design Performance Guidelines

These performance guidelines establish the lateral separation between the roadway travel lanes and the roadside sidewalk area based upon factors such as traffic volume, speed, and vehicle mix as well as geometric cross-sectional features of the roadway. Other parts of the pedestrian transportation system must be enhanced as well to achieve the overall objectives of the Maricopa Association of Governments. These include: meeting ADA accessibility standards, improved pedestrian accommodation & safety at intersections and mid-block crossings, and providing the shade canopy and street furniture and other pedestrian travel amenities covered in the 1995 MAG Pedestrian Area Policies and Design Guidelines and applicable local, state, and national roadway and traffic design guidelines.

Action Plan

Pedestrian Plan 2000 includes a summary of necessary actions and programs to meet the Regional goals and objectives. This Action Plan was developed through interaction among the standing MAG Pedestrian Working Group, the Public Stakeholders Group, the consultant team, and MAG staff. It consists of specific short term (one year), mid-term (2-3 years) and long-term (4-5 years) programs and activities that are necessary to bring about an increase in walking trips in the Region and a corresponding decrease in traffic congestion.

³ MAG Pedestrian Plan 2000, Final Report, Section 2: Existing Conditions

Future Funding Sources without Sales Tax Extension

Revenue for regional transportation facilities are derived from a variety of local, state and federal sources. The voter approved ½ cent sales tax provides over half of the revenue to fund needed regional transportation improvements. However, the sales tax is subject to re-authorization in 2004 by the voters of Maricopa County. If approved, its revenues are secured for the next 20 years.

Without the Maricopa County ½ cent sales tax for transportation, \$8.8 billion is estimated to be available to fund needed improvements. The sources for these funds include:

- **Fuel Taxes**
Taxes on fuel sales in Arizona are levied on a per gallon basis. Fuel tax revenues are the principle element of the Highway Users Revenue Funds (HURF). As the volume of fuel sales changes, the fuel tax can be adjusted legislatively to maintain a consistent level of funding. The region's adopted Long Range Transportation Plan, in part, relies on periodic increases in the fuel tax and along with adjustments for inflation.⁴
- **General Funds**
City General funds are used for street projects and to provide transit services. These funds are into 5-year transportation improvement programs (TIP's) and annually reviewed and approved by city and town councils.
- **Federal Funds**
Federal funding for transportation is authorized and adjusted by Congress. The last reauthorization was the Transportation Efficiency Act for the 21st Century (TEA-21) which ends this fiscal year. The reauthorization process is underway for Safe, Accountable, Flexible and Efficient Transportation Equity Act of 2003 (SAFETEA). Federal funds support a portion of bus service and 50% of the capital costs for an initial light rail corridor. The majority of MAG Federal funds are committed to new freeways while smaller amounts are typically programmed for transit, street, bicycle and pedestrian projects.
- **ADOT Discretionary Funds**
These funds include HURF and federal funds that ADOT can spend anywhere in the State. The MAG region relies on a fair share of these funds being allocated to the MAG region.
- **Developer Contributions**
Exactions and developer fees are used to pay for local streets and a significant portion of new arterial street construction. These contributions are projected to continue in the future.
- **Local**
City and Town General Funds allocate money for street and transit projects. Developer contributions and fees are used to construct expansions to the local and arterial street network. Occasionally, developers fund freeway interchange

⁴ MAG Long Range Transportation Plan 2002 Update, Appendix C Trend Funding Strategy

enhancements related to master planned communities such as Anthem in northern Maricopa County.

Several MAG member agencies have successfully implemented transit-specific sales taxes. In 1996, the city of Tempe passed a half-cent sales tax dedicated for transit, allowing them to expand their existing bus service and explore future options, such as light rail. In 1998, the City of Mesa passed its Quality of Life half-cent sales tax, which dedicated a small portion for transit. In March of 2000, the City of Phoenix passed a four-tenths of a percent sales tax for improvements to local bus service, Bus Rapid Transit (beginning 2003), Light Rail (beginning 2006), Neighborhood Mini-Bus Service, and more. In November of 2001, the City of Glendale passed a half-cent sales tax dedicated for transit and other transportation improvements.

5.3 Projected Surface Transportation Situation

To facilitate long range planning for regional transportation, it is necessary to understand both sides of a complex equation: (1) future needs fueled by projected growth, and (2) anticipated resources that will be available to complete improvements aimed at maintaining acceptable levels of service. MAG maintains a comprehensive set of models to systematically project employment and population, traffic demand, and air quality. These models allow both the projection of current trends and the evaluation of planning alternatives.

Regional Growth

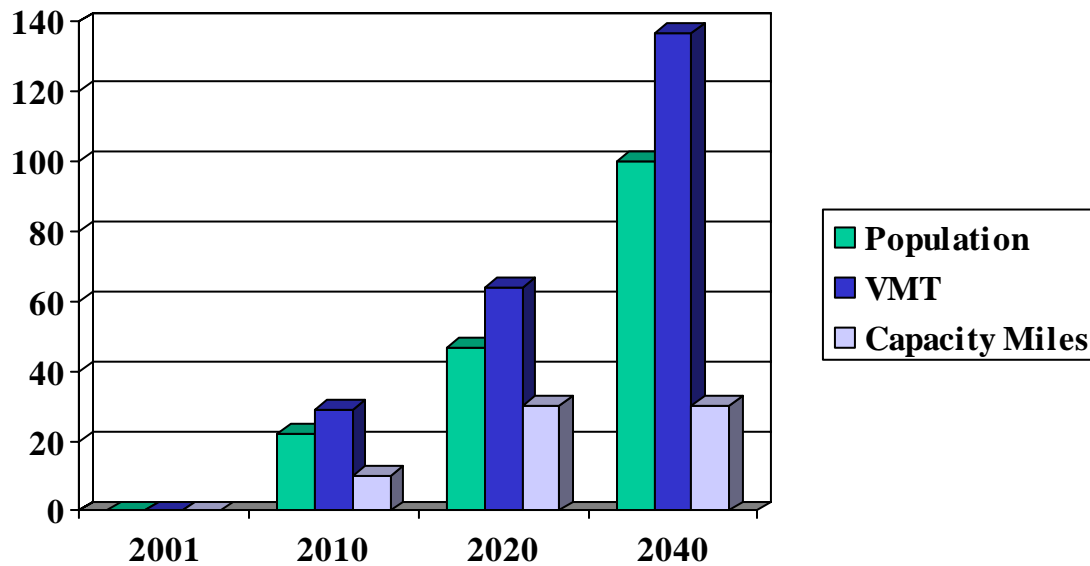
One key to the future development of transportation infrastructure, and ultimately the livability of the region, will be our capability to balance population growth with local employment growth. Seeking a jobs-to-housing balance at the local level has to be a basic planning principle for Maricopa County communities. Employment projections, based on a myriad of inputs including economic trends and adopted local plans, show substantial employment gains at job centers spread across the region. This planned and projected dispersal of employment centers supports improved regional jobs-to-housing balance and overall sustainability of the region. Recognizing travel demand created by the anticipated regional development pattern is crucial in creating the Regional Transportation Plan. Employment and population growth are addressed in greater detail in Chapter 6 of this report.

Projected Travel Demand

As growth continues in the Maricopa region, demand for travel increase proportionately. Background studies, preparatory to the creation of the RTP, provide sound information bases for projecting future travel patterns. MAG travel demand models forecast roadway and transit use throughout the metropolitan area. Key outputs of these models include projections of average daily traffic, peak hour traffic, peak hour traffic trips by purpose and mode, traffic volume to roadway capacity ratios, level of service at intersections, delay and travel time.

Using a baseline model of the existing regional system and already committed improvements, the relative growth, on a percentage basis, of population, vehicle miles traveled (VMT), and capacity miles are illustrated in Figure 5-6. Year 2020 population is projected increase about 45% while VMT increases over 60% and system capacity increases only 30%. Year 2040 population reflects a 100% increase in population, a 135% increase in VMT, with capacity miles remaining the same. As such, dramatic increases in congestion and significant travel delays are the result of transportation system capacity not keeping pace with regional growth.

Figure 5-6
Percent Growth of Population, VMT and Capacity Miles



The travel demand modeling process uses population projections to generate projected travel. Given projected travel, the future level of service (LOS) for the committed arterial and freeway system can be analyzed. Figures 5-7 illustrate current (year 2000) peak hour freeway levels of service. Level of service F is found over most of the freeway system (Figure 5-8) by the year 2030. Similarly, the Levels of service for intersections deteriorate substantially by the year 2030 (Figures 5-9 and 5-10).

2000 PM Peak Hour Levels of Service

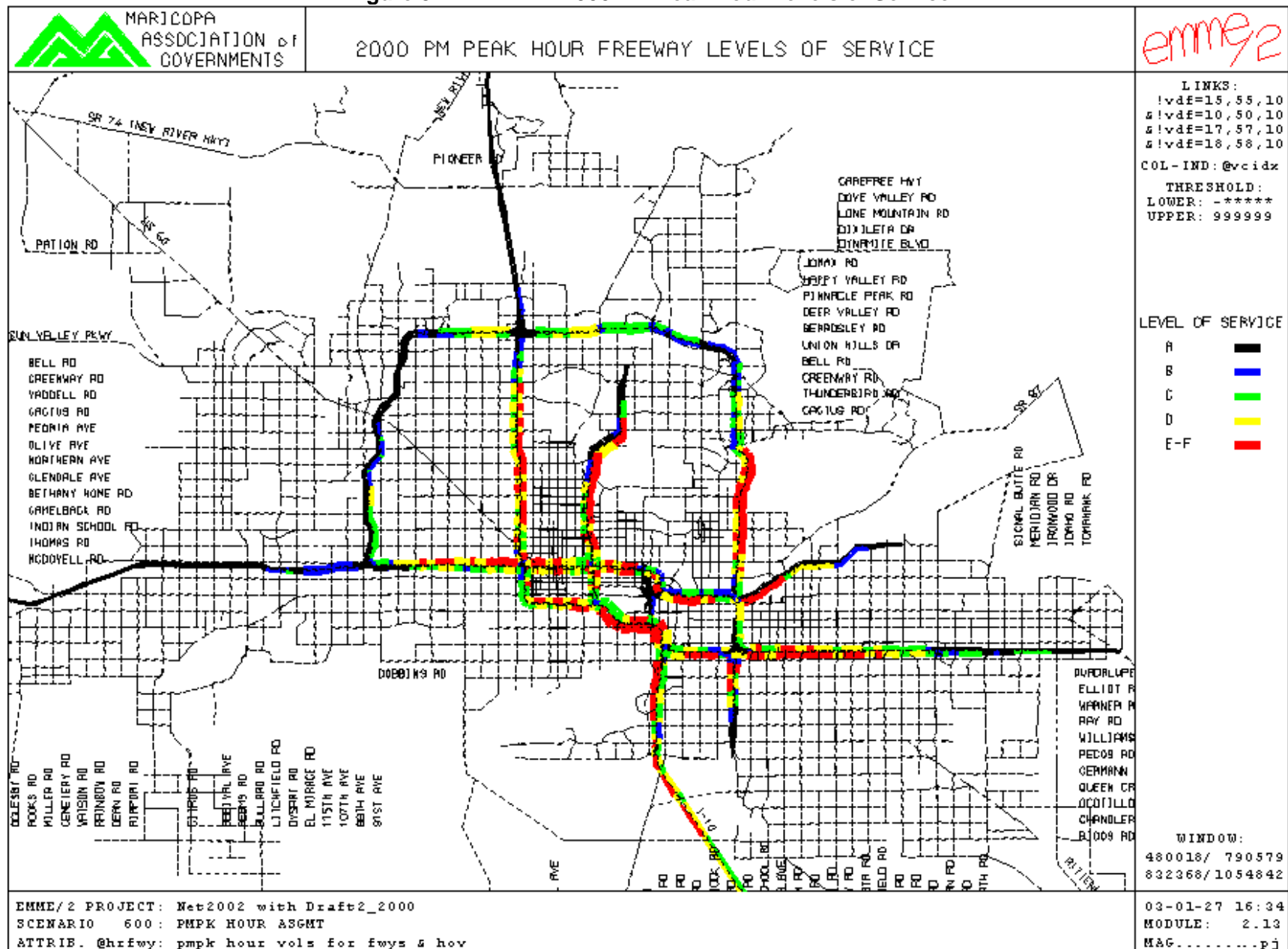


Figure 5-8

2030 PM Peak Hour Freeway Levels of Service

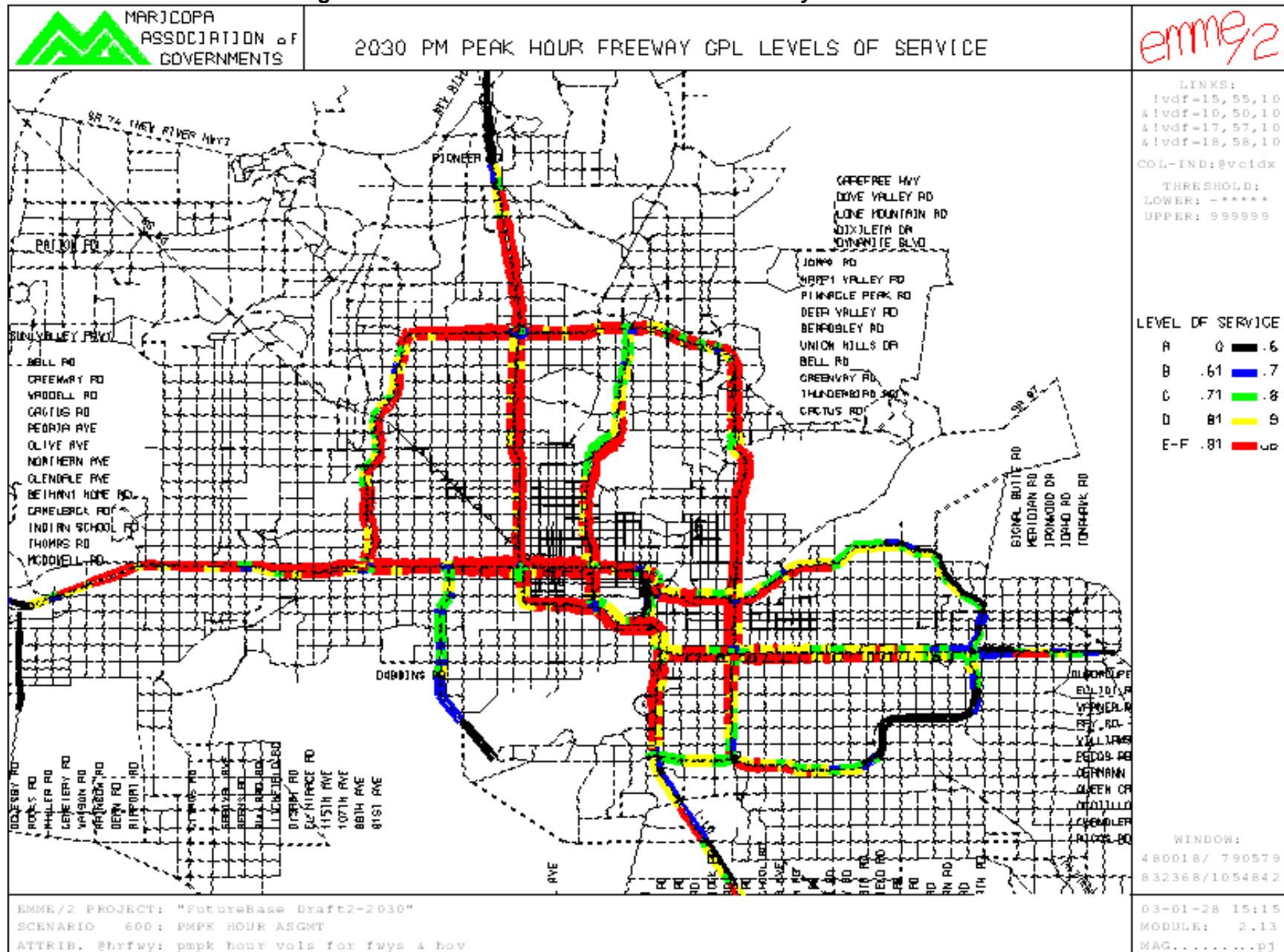
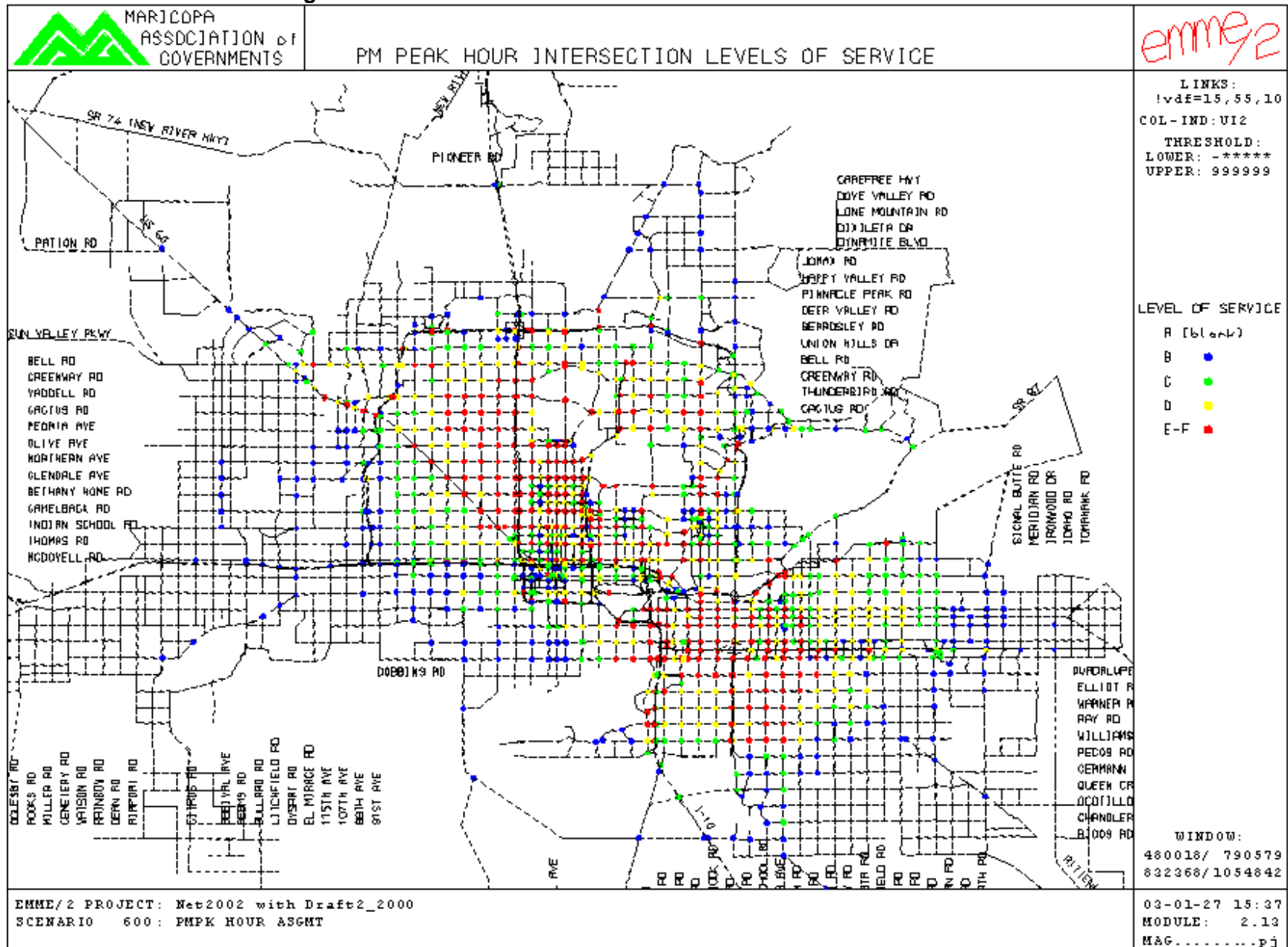
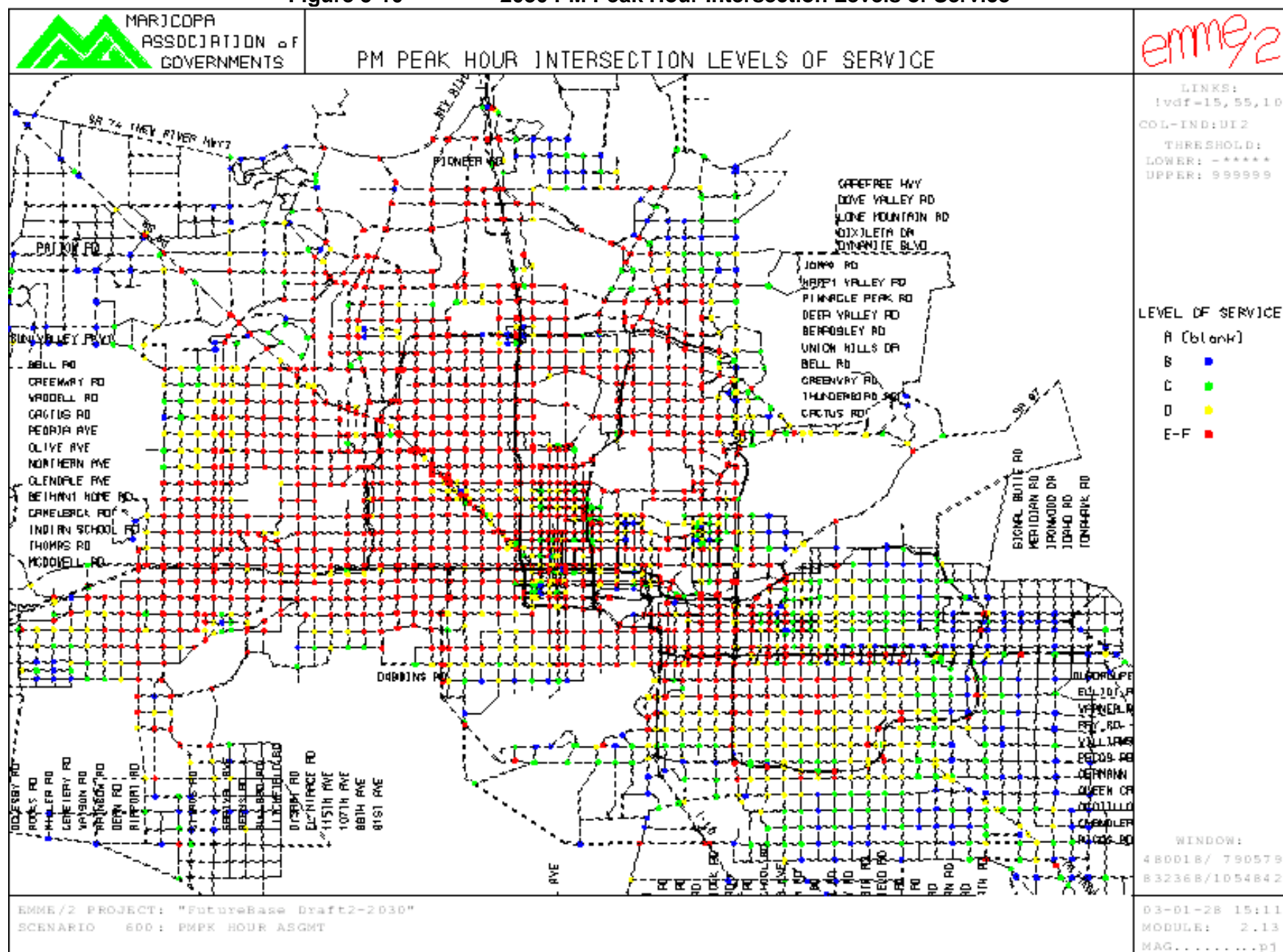


Figure 5-9

2000 PM Peak Hour Intersection Levels of Service



2030 PM Peak Hour Intersection Levels of Service



5.4 Regional Transportation Plan

As growth and congestion have increased, and, with projections forecasting additional, substantial growth, MAG and its member communities are seeking ways to better serve the mobility needs of the Region's population and industry. The new Regional Transportation Plan (RTP) is the most significant transportation planning effort in Maricopa County since the 1960 regional transportation plan and will assure that the region's resources are efficiently allocated to sustain a transportation system that serves the needs of residents and visitors while supporting a healthy regional economy. As the region prepares to vote on re-authorization of the ½ cent sales tax for transportation improvements, it is vital to have the RTP as a blueprint for public review that links public expenditures with future transportation system needs.

Regional Transportation Planning Process

The new Regional Transportation Plan is being developed under the direction of the regional Transportation Policy Committee (TPC). The RTP will guide transportation investments in the region for the next several decades. The last major update to the RTP was completed in the mid-1980's. The new RTP will include all modes of transportation and will be based on adopted goals, objectives, and strategies for the future.

The RTP is being developed using a multi-phase, comprehensive process that focuses on performance based planning and a continuing, inclusive public involvement program. Phase 1 focused on defining policies, goals and alternative scenarios for regional growth and transportation investments. Phase 1 included expert panel forums and issue papers, sub-regional focus groups, analysis of existing and planned transportation systems, draft values, goals and objectives, an assessment of long range transportation needs, and the creation of a set of transportation planning principles. Phase 2 of the RTP process includes the evaluation of alternative transportation scenarios and the identification of a financially realistic, hybrid plan that addresses long-range transportation needs of Maricopa County.

Public Involvement

The Maricopa Association of Governments (MAG) has spent the past two years conducting intensive transportation studies and talking to thousands of people to identify future transportation needs. During Phase I of the Regional Transportation Plan and the first half of Phase II, MAG held 150 public input opportunities, 173 stakeholder opportunities (including focus groups involving minority and senior travelers as well as several safety forums) and 117 agency meetings to solicit input from the public, transportation stakeholders, elected and appointed leaders, city planners, transportation councils, and Native American Indian Communities.

During most of these events, citizens were asked to complete one of two surveys, a Funding Priorities Survey or a Four-Question Survey, to help gauge their individual and group spending priorities. Figure 5-11 summarizes the spending priorities of public involvement participants. Each person was given a \$100 budget and asked to allocate funds for transportation system improvements.

Goals, Objectives and Performance Measures

As a product of the public involvement process, Regional Transportation Plan goals and objectives have been developed. These goals and objectives provide the structure for developing options and evaluating scenarios.

Performance measures have also been identified and linked with specific goals and objectives, so that the evaluation process reflects key regional issues and concerns. Performance measures were applied in the scenarios evaluation phase of the RTP process. In the evaluation of scenarios, the values for the performance measures were used to assess the relative strengths and weaknesses of the scenarios, and help provide insights into the tradeoffs associated with different transportation investment strategies.

The goals for the Regional Transportation Plan are:

Goal 1: System Preservation and Safety

Transportation infrastructure that is properly maintained and safe, preserving past investments for the future.

Goal 2: Access and Mobility

Transportation systems and services that provide accessibility, mobility and modal choices for residents, businesses and the economic development of the region.

Goal 3: Sustaining the Environment

Transportation improvements that help sustain our environment and quality of life.

Goal 4: Accountability and Planning

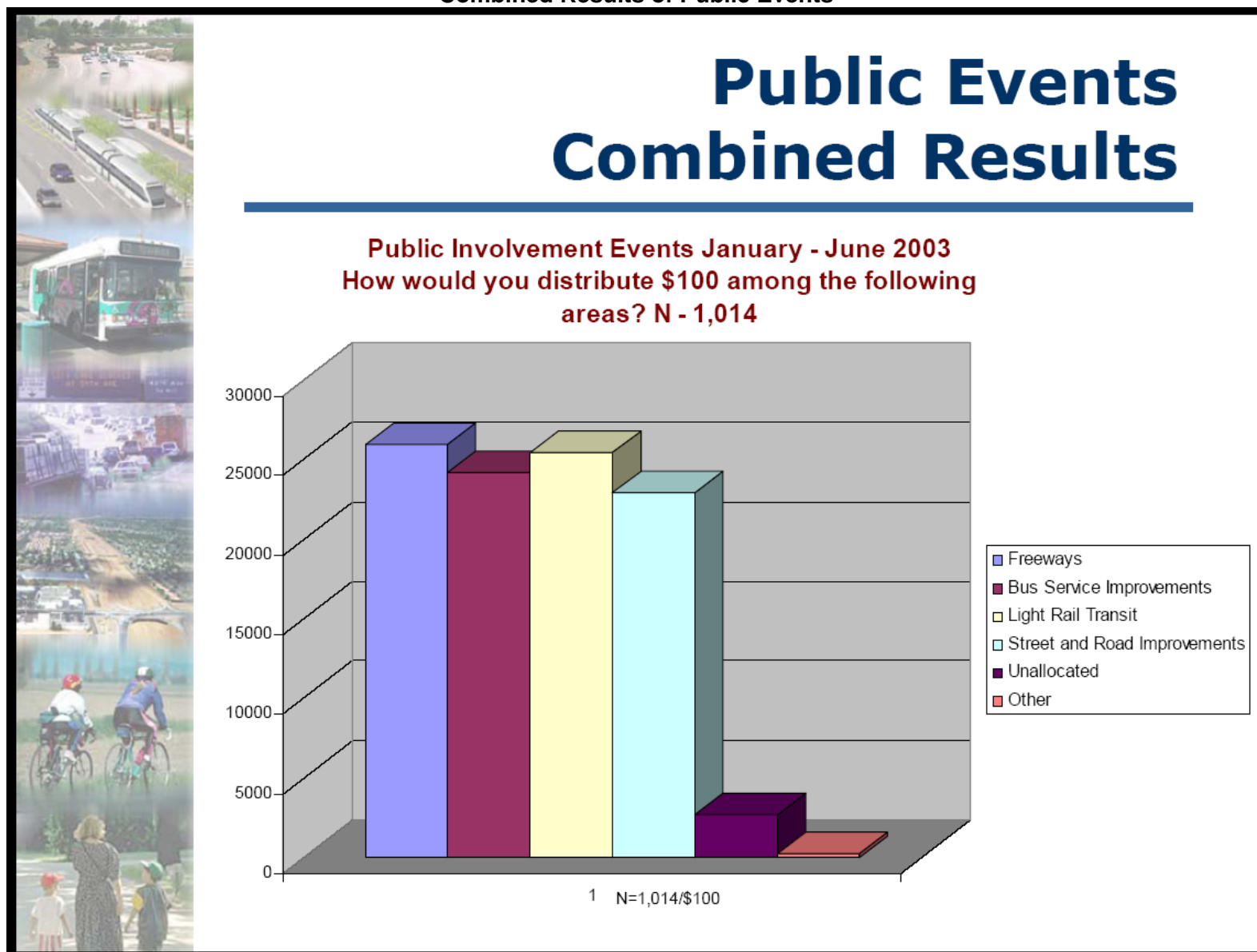
Transportation decisions that result in effective and efficient use of public resources and strong public support.

Background Studies

Extensive background studies have been prepared to support the RTP process. In order to formulate an effective and achievable transportation plan, a thorough understanding of existing conditions and identification of known problems and issues across the region is essential. Detailed descriptions and findings of each study are available from the Maricopa Association of Governments and on the MAG worldwide web site.

- **Northwest Area Transportation Study**
- **SE Maricopa/Northern Pinal Transportation Study**
- **Southwest Area Transportation Study**
- **Regional Freeway Bottleneck Study**
- **East/West Mobility Study**
- **High Capacity Transit Study Final Report**
- **High Occupancy Lanes and Value Lanes Study Final Report**
- **Grand Avenue Northwest Corridor Study**
- **Intelligent Transportation Systems (ITS) Strategic Plan**
- **CANAMEX Corridor Study**
- **Park and Ride Site Selection**
- **West Valley Rivers Trails Projects**

Figure 5-11
Combined Results of Public Events⁵



⁵ RTP Input Opportunity Interim Report Executive Summary, June 2003

Modeling Scenarios and Hybrid Draft Plan

Three modeling scenarios were analyzed for their performance in meeting regional needs, goals and objectives as part of the preparation of the Regional Transportation Plan. The scenarios were distinct with investment emphasis in Scenario A on freeways, Scenario B on major alternate streets, and Scenario C on transit.

General conclusions drawn from evaluating the scenarios were:⁶

- The \$15 billion that will be invested in transportation improvements with the extension of the half-cent sales tax and other available funding will potentially reduce regional delay to half or less of what it would be without the investment.
- A number of freeways in Scenario A address future congestion and mobility in developing areas of the region, while others in this scenario provide future growth areas with links to the regional transportation network.
- To deal directly with existing congestion, bottleneck and other capacity improvements on the existing freeway system will be important.
- The addition of High Occupancy Vehicle (HOV) lanes and freeway-to-freeway HOV ramp connections have a positive impact on congestion by both providing additional capacity for all vehicles and by improving express transit operations, thus improving its competitive position with the private automobile.
- Compared to the base network, the transit system provided in Scenarios A and B resulted in a percent increase in ridership about equal to the percent increase in service, while the percent increase in ridership between Scenarios B and C was about half the percent increase in service.
- Scenario B, the most balanced combination of freeway, major arterial, and transit improvements resulted in 5 percent less delay than the freeway emphasis scenario and 10 percent less delay than the transit emphasis scenario.
- There is the potential for strong transit demand in a number of corridors in the valley.

Hybrid Plan

Based on the assessment of the scenarios, the region's Transportation Policy Committee has developed a hybrid modeling scenario to form the basis for an adoptable regional plan. The hybrid scenario embraces a balanced approach to investment as opposed to heavy emphasis on any major modal category. The Hybrid Plan also identifies a set of regional funding sources that are allocated among the proposed improvements. While undergoing refinement at the policy level, the hybrid scenario included approximate regional investment levels for each major travel mode: freeways/highways, transit, and major streets. Funding levels by modal category are summarized in Figure 5-12.

In preparing refinements to the Hybrid Draft of the RTP, overall observations derived from the planning process included:

- There are more quality projects than available funding.
- The needs in different areas of the region reflect different stages of growth and development.
- Priorities include the need to maintain the economic viability of developed core areas.

⁶ Regional Transportation Plan, Alternatives Stage, Transportation Modeling Scenarios Evaluation, May 22, 2003

Final Draft Plan

The Hybrid Plan was evaluated, refined and developed to provide the basis for the Final Draft Plan. The final draft of the Regional Transportation Plan for the Maricopa Region, as approved by the MAG Transportation Planning Committee includes four key components: Regional Transportation Revenue Sources, Transportation Improvements (projects), Plan Analysis and Phasing Priorities. The Plan covers the 20-year period, 2006 to 2025, coinciding with revenues from a dedicated, regional ½ cent sales tax.

Regional Revenue Sources Including Sales Tax Extension

The magnitude and sources of future regional transportation revenues are important considerations in the development and evaluation of the regional transportation plan. The funding sources include: 1) ADOT 15% funds, 2) ADOT Discretionary Funds, 3) federal transit 5307 funds, 4) federal transit 5309 funds, 5) federal surface transportation funds (STP), 6) federal congestion mitigation and air quality funds (CMAQ), and 7) extension of the county-wide half-cent sales tax for transportation.

The RTP has been constrained to reflect levels of future funding from Federal, State and local sources for the 20-year period covering 2006 to 2025. A total of \$15.8 billion (in 2002 dollars) has been projected to be available from regional revenue sources for the 20-year period. A breakdown of regional revenue sources for regional transportation improvements is shown in Figure 5-12.

The regional transportation revenues identified in Figure 5-12 are the focus of the RTP process, since they represent those resources that can be planned and programmed at the regional level. However, there are other revenue sources that play an important role in meeting transportation needs. Examples of these include local revenue contributions, city and county shares of the Arizona Highway User Revenue Fund (HURF), local sales taxes and general funds, and developer financed street construction.

The current, regional, half-cent sales tax for transportation goes almost entirely to the regional freeway system. The new RTP uses a balanced approach, allocating sales tax revenues to a variety of uses including arterial streets, rail transit and bus expansion, as well as freeways. If renewed by County voters in 2004, this source is predicted to generate an additional \$9 billion for transportation between 2006 and 2025.

Regional Transportation Plan Components

The Transportation Policy Committee developed a Plan that covers transportation improvements and proposed funding allocations for the regional transportation network for the period covering FY 2005 through FY 2026. The Plan includes funding for the following components: freeways and highways, streets, regional bus, and high capacity transit, as well as bicycle and pedestrian facilities. In addition to funding highway infrastructure and transit vehicles, funding is also provided for freeway maintenance and regional bus operations. Funding allocations by transportation mode are depicted in Table 5-2.

Table 5-2 briefly summarizes the distribution of funding among the key components in the Plan. In the Plan, a total of \$15.8 billion in transportation improvements, including the allocations for

cost contingencies, has been identified. The Plan allocates approximately 58% of the total regional funds to freeway/highway projects, 32% to transit (15% light rail, 17% bus) improvements, 8% to major streets projects, and the remaining 2% to other regional programs. In terms of the one-half cent revenue source only, these percentages are very similar, with 58% freeway/highway, 34% transit, 8% major streets, and less than 1% to other programs. The \$15.8 billion cost figure includes a contingency factor to help account for the uncertainty associated with the planning-level project cost estimates used in the RTP.

Freeways/Highways

The RTP contains a major freeway/highway element, providing for both new freeway corridors and improvements to existing, or soon to be completed, freeway facilities. These improvements are also shown in Figure 5-12.

The Plan also includes widenings and other improvements to the regional freeway/highway network, which total \$4.5 billion, representing 29% of the cost of all projects identified by the RTP.

The RTP also identifies funding for maintenance on the freeway system directed at litter-pickup and landscaping. In addition, the need to keep traffic flowing smoothly is addressed through funding identified for freeway management functions. Together, these components total \$499 million or 3% of the total.

In total, \$9.1 billion, or 58%, of the \$15.8 billion in projects identified by the Plan is allocated to the freeway/highway element.

Arterials

The RTP includes funding for new and improved major streets in the region. These projects, shown in Figure 5-13, cover a variety of improvements to the major street system, including widening existing streets, improving intersections, and constructing new arterial segments.

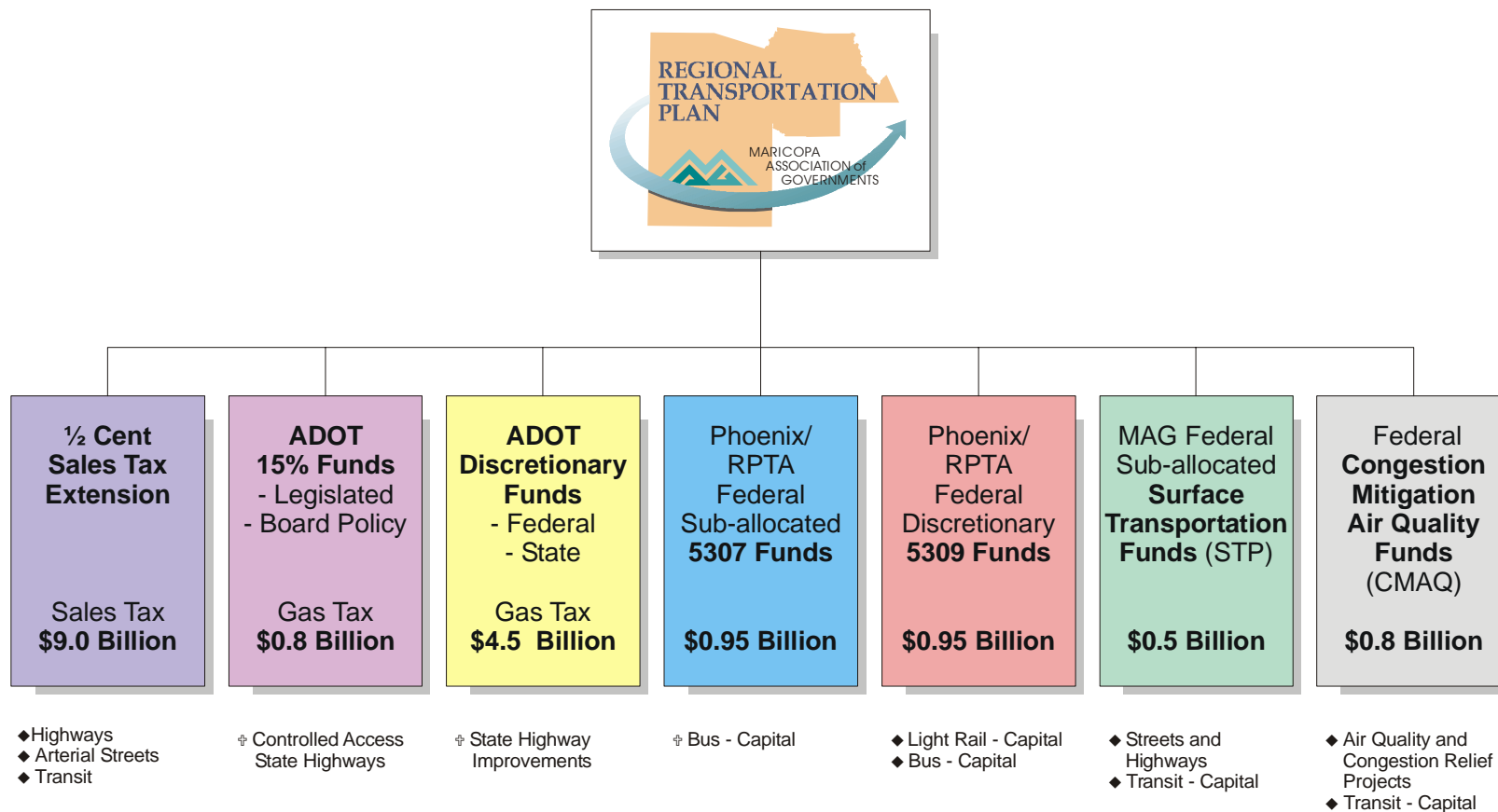
In total, \$1.2 billion, or 8%, of the \$15.8 billion in projects identified by the RTP is allocated to the major street element. The Plan calls for a match of 30% from the implementing jurisdiction for projects in this category.

Bus Service

The RTP includes funding for regional bus service in the MAG area. These improvements are shown on the “Proposed Super-grid System” map, Figure 5-14. The implementation of the super-grid system would ensure that residents of the region have access to dependable, integrated, region-wide transit services.

Express bus and bus rapid transit (BRT) service are also included under regional bus element in the RTP. The proposed freeway and arterial BRT routes are shown in Figure 5-15. The express bus and BRT routes would complement the super-grid system, providing a higher level of service for longer transit trips, with an emphasis on linking key activity centers in the region. The Plan calls for regional funding of both capital and operating costs (net of fare receipts) for this service, as was the case for the super-grid system.

Figure 5-12
Major Regional Revenue Sources (2006-2025)*



\$ 17.5 billion Total Available
 Less: \$ 1.7 billion for interest and ADOT commitments
 \$ 15.8 billion Net Available

Table 5-2¹

Draft Hybrid Funding by Mode (million '02 \$'s)						
	One-Half Cent		State & Federal		Total	
	\$'s	%	\$'s	%	\$'s	%
Available \$'s	\$8,500		\$7,319		\$15,819	
Freeways/ Highways	\$4,774	56.2%	\$4,269	58.6%	\$9,043	57.3%
Major Streets	\$863	10.2%	\$602	8.3%	\$1,465	9.3%
Transit	\$2,831	33.3%	\$2,170	29.8%	\$5,001	31.7%
Programs	\$31	0.4%	\$246	3.4%	\$277	1.8%
Total	\$8,499	100.0%	\$7,287	100.0%	\$15,786	100.0%
Excess/(Deficit)	\$1		\$3		\$33	
			2			

The Plan also includes funding for bus maintenance and passenger facilities. The passenger facilities include both park-and-ride lots and transit centers. The location of passenger facilities is indicated in Figure 5-15 as well.

In total, \$2.4 billion, or 15% of the total cost of projects identified by the RTP is allocated to the regional bus element. This includes \$1.3 billion for capital needs and \$1.1 billion for operating costs. A significant portion of the capital needs is devoted to maintenance and passenger facilities. As noted, the RTP does not require a match from local jurisdictions for operating costs related to transit services provided under this element.

Light Rail

The RTP includes funding for the development of an extensive light rail transit system (LRT) in the MAG area. These high capacity corridors are shown in Figure 5-16 and represent a total system of 57.7 miles. The Plan addresses different cost elements in the various corridors identified on the map. In addition, it is important to note that, unlike the regional bus element, the Plan does not direct any regional funding to operating costs for LRT.

In total, \$2.3 billion, or 15% of the \$15.8 billion in projects identified by the Plan is allocated to the LRT element. Funding for this element represents expenditures on capital items only, and the Plan does not cover operating costs, which would be the responsibility of the implementing local jurisdictions.

Commuter Rail

The RTP provides for continuing development of commuter rail options for the region. A total of \$5 million is allocated in the Plan to develop commuter rail options and implementation strategies.

¹ Final Draft RTP, MAG, September 10, 2003.

Other Transit Services

In addition to regional bus and LRT, the RTP includes funding for other transit services in the MAG area. These include paratransit services required by the Americans with Disabilities Act (ADA), the regional van pool program, and rural/non-fixed route transit service. (The City of Phoenix will continue to fund ADA paratransit service inside Phoenix with local funds.) Taken together, these other transit items are allocated a total of \$336 million in the Plan, which represents approximately 2% of the total \$15.8 billion identified in the Plan. Of this total, \$122 million is designated for capital items and the remainder for operating costs (net of fare receipts).

Bicycle Pedestrian Trails

This element of the RTP totals \$276 million or about 2% of the total \$15.8 billion identified in the Plan. The major components in this item are bicycle and pedestrian projects (\$132 million), and air quality mitigation projects (\$113 million). Plan implementation studies, such as corridor assessments and major investment studies (MIS), are also included in the regional programs element.

Analysis of Final Draft Plan

The Final Draft Regional Transportation Plan was evaluated using a set of transportation system performance measures and plan evaluation criteria, which were accepted by the Transportation Planning Committee. Performance measures and criteria were developed to provide information regarding the advantages and disadvantages of various approaches to meeting future travel needs and assess the relative strengths and weaknesses of transportation network scenarios. To ensure that the evaluation process reflects key regional issues and concerns, each of the measures and criteria was linked with a specific RTP goal and objective. This performance information was utilized to prepare the hybrid network scenario, which, in turn, provided the basis for the Final Draft Plan.

Performance Measure Assessment

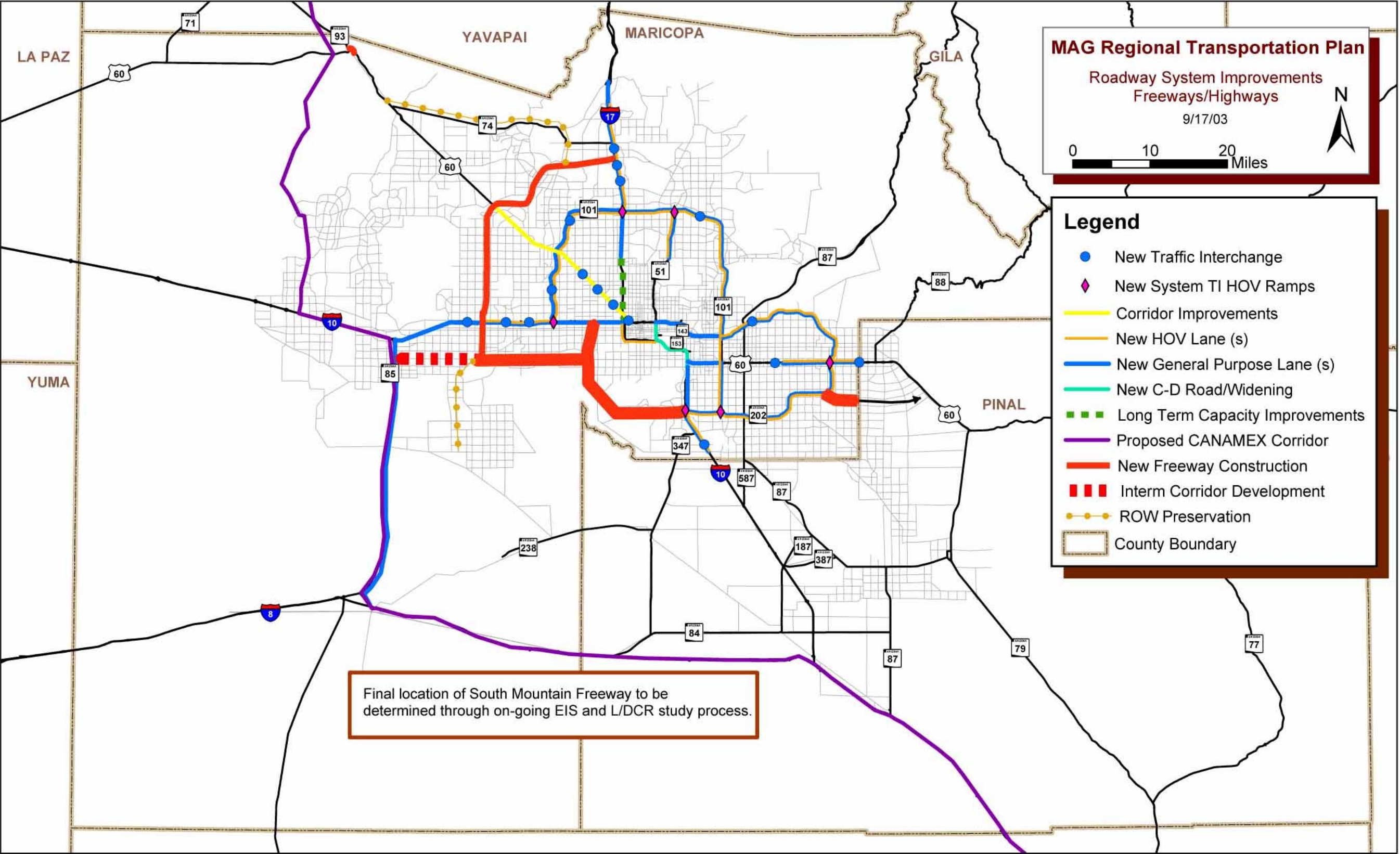
Values for the transportation performance measures were estimated using the MAG regional transportation demand modeling system. The MAG model was applied to a base network and to the RTP utilizing population, employment, and land use projections for the year 2025.

The highlights of the performance of the RTP compared to the base case and the general conclusions of the evaluation are provided below:

- The \$15.8 billion that would be invested in multi-modal transportation improvements in the RTP reduce regional PM peak period delay to half of what it would be without the investment; 1,754,851 hours compared to 907,230 hours.
- On a per capita basis, PM peak period delay would result in a decrease of 49% from the base scenario.
- On arterial streets, when compared to the base case, the RTP has 50% fewer intersections operating at level-of-service "F"; 34% vs. 17%.

Figure 5-12 B

Freeways/Highways



New/Improved Arterials

Figure 5- 13

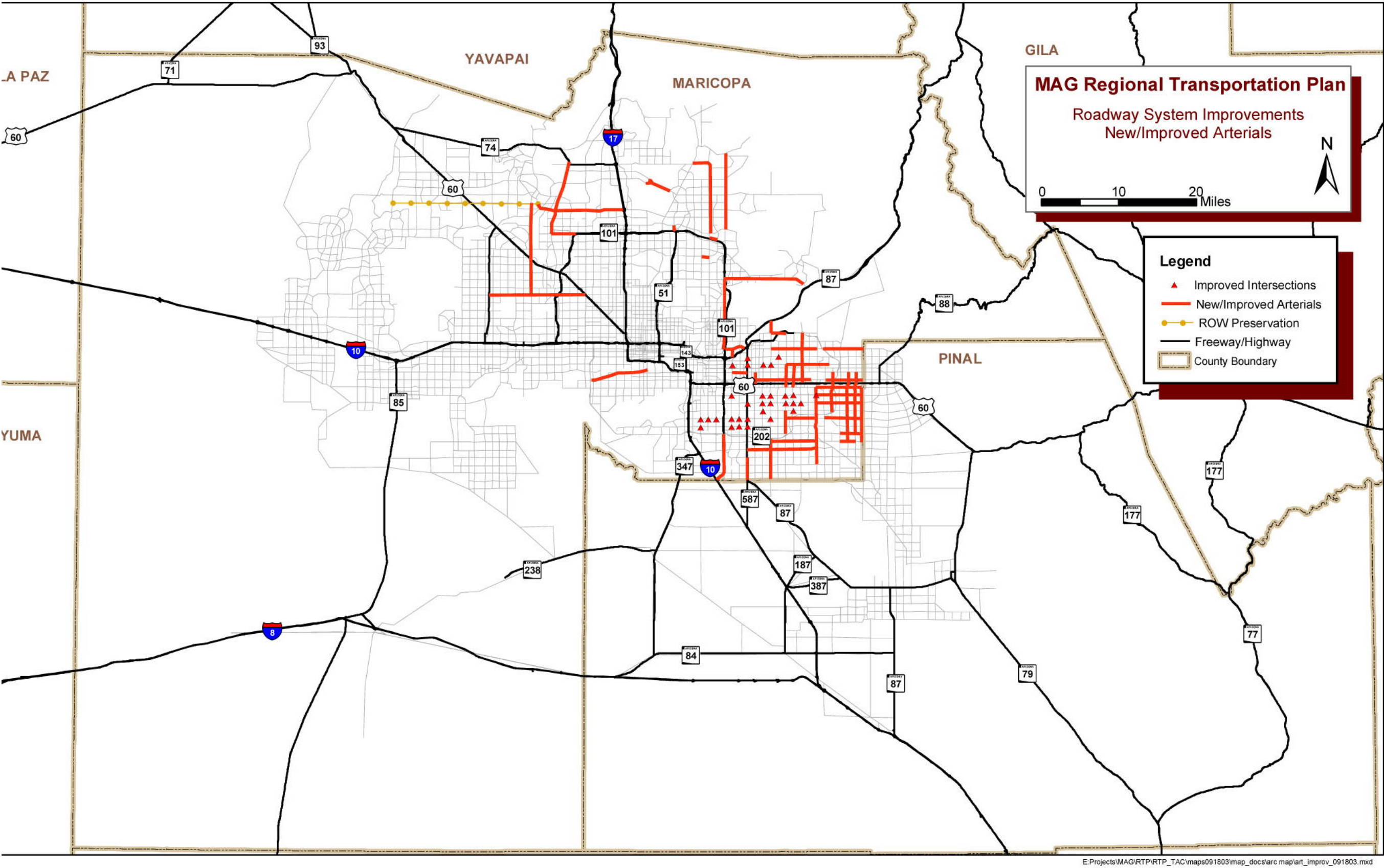
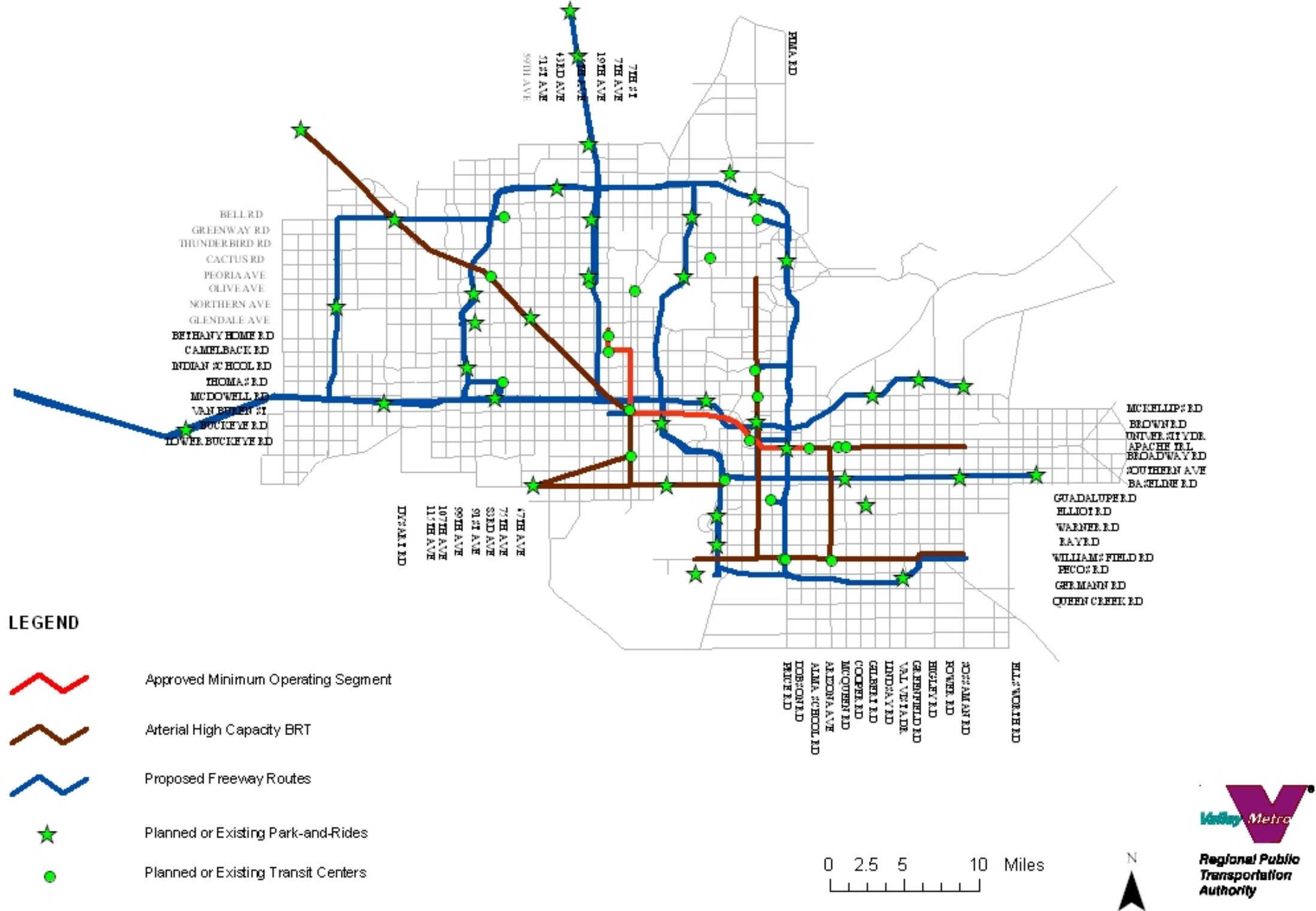


Figure 5-14



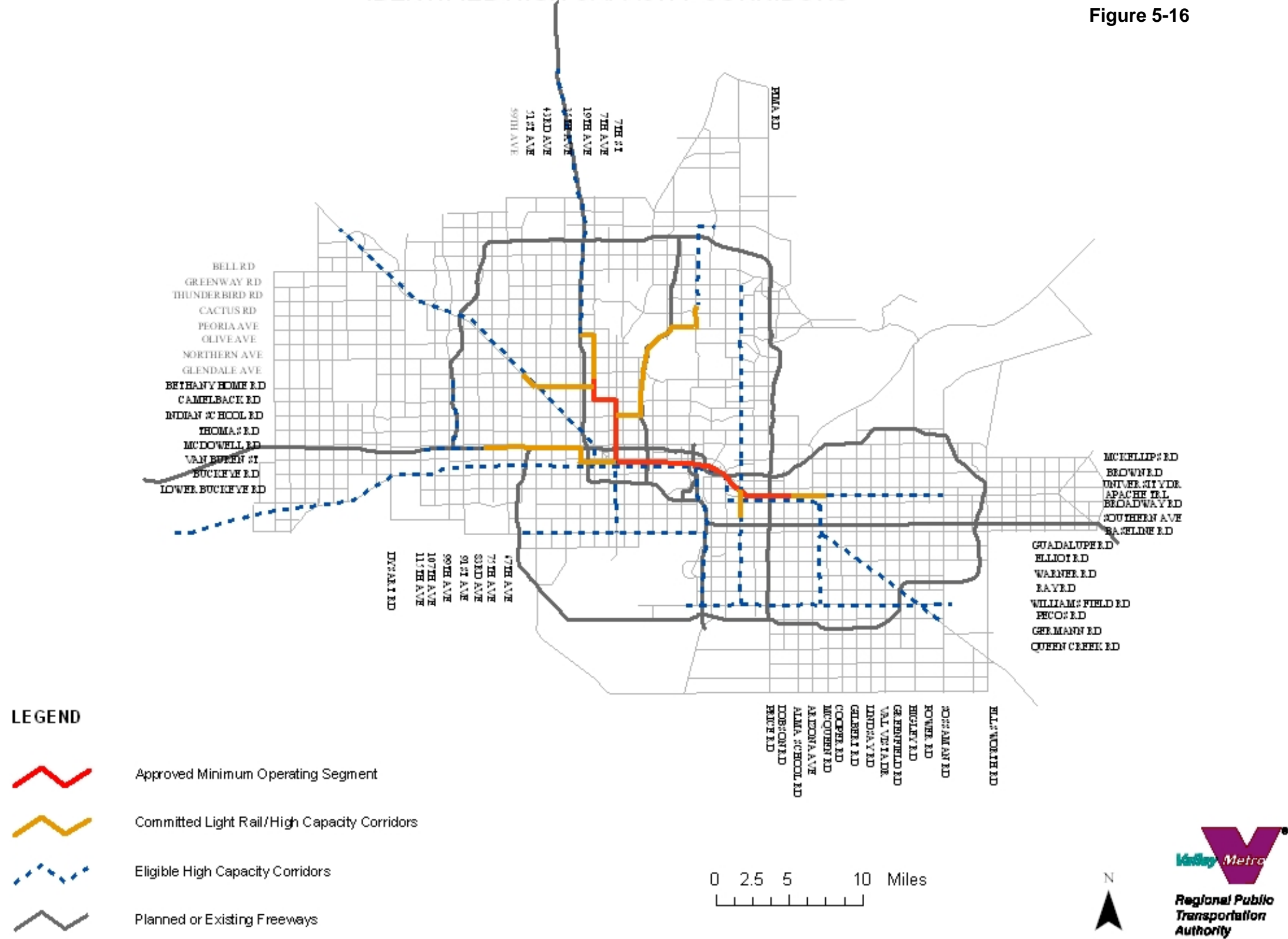
FREEWAY AND ARTERIAL BRT ROUTES

Figure 5-15



IDENTIFIED HIGH CAPACITY CORRIDORS

Figure 5-16



- The RTP has a balanced combination of freeway, major arterial, and transit improvements that results in 29% lower peak-period hours of travel per capita.
- The RTP has 4% higher Vehicle Miles Traveled (VMT) per capita. Total travel is estimated at 184.8 vehicle-miles for the base case and 192.3 vehicle-miles for the RTP. However, even with higher travel levels in the RTP, both the crash rate and emissions are reduced, due to the greater efficiency of the system.
 - The annual crash rate per 100 million vehicle miles traveled dropped from 4.22 in the base case to 3.93 with the RTP.
 - Total emissions dropped 11% with the improvements in the RTP.
- New freeways in the RTP provide congestion relief and link future growth areas to the regional transportation network. The RTP has 57% higher average PM peak period freeway speed, 22 mph vs. 14 mph.
- Congested lane miles of freeways (level-of-service “E” or worse), as a percentage of the total, improves from 58% in the base network to 48% in the Plan.
- In the Plan, total transit boardings increase by 36%.
- With the expanded transit network coverage provided in the RTP, there are 22% more jobs within ¼ miles of transit compared to the base.

Title VI and Environmental Justice

For the Title VI and Environmental Justice assessment analysis of the RTP, U.S. Census 2000 data was used to determine communities of concern. Communities of concern are census tracts that contained higher than the countywide average for any of the following population groups: minority, low income, aged populations, populations with mobility disabilities, and female heads of households with children.

The Title VI and Environmental Justice assessment for each mode are summarized below:

- Freeways/highways: With the exception of the population aged 60 and older, over 40 percent of census tracts (with a higher than countywide average percentage of communities of concern) are located within one-quarter mile of a freeway/highway component of the RTP. This compares to 26 percent for all other tracts. Many of the tracts with a higher than average percentage of population aged 60 and older are located in the northern portion of the MAG Area. These tracts are well served by the freeway network, but fall outside the quarter mile buffer of the proposed alignments.
- New/improved Arterial Streets: Less than 20 percent of the census tracts (with a higher than countywide average percentage of communities of concern) are directly affected by the RTP improvements that consist of arterial street improvements and new arterial streets. The Plan includes a limited number of these improvements, as most arterial are constructed by the local jurisdictions. Most of the regional arterial improvements are located in the peripheral parts of the region, outside of the areas where the majority of the census tracts with communities of concern are located.

- *Transit Network:* Nearly 90 percent of census tracts (with a higher than countywide average percentage of communities of concern) are served by the proposed RTP transit network. Local transit service that is not regionally funded may serve much of the rest. RTP funding for transit represents approximately one-third of the overall funding, demonstrating a continuing commitment to provide transportation options for low income residents.

RTP Phasing Priorities

The sequence in which the components of the Regional Transportation Plan are implemented over time is a key element in the planning process. The implementation of the Plan was divided into four phases, covering the planning period as follows:

- Phase I FY 2005- FY 2010
- Phase II FY 2011- FY 2015
- Phase III FY 2016- FY 2020
- Phase IV FY 2021- FY 2026

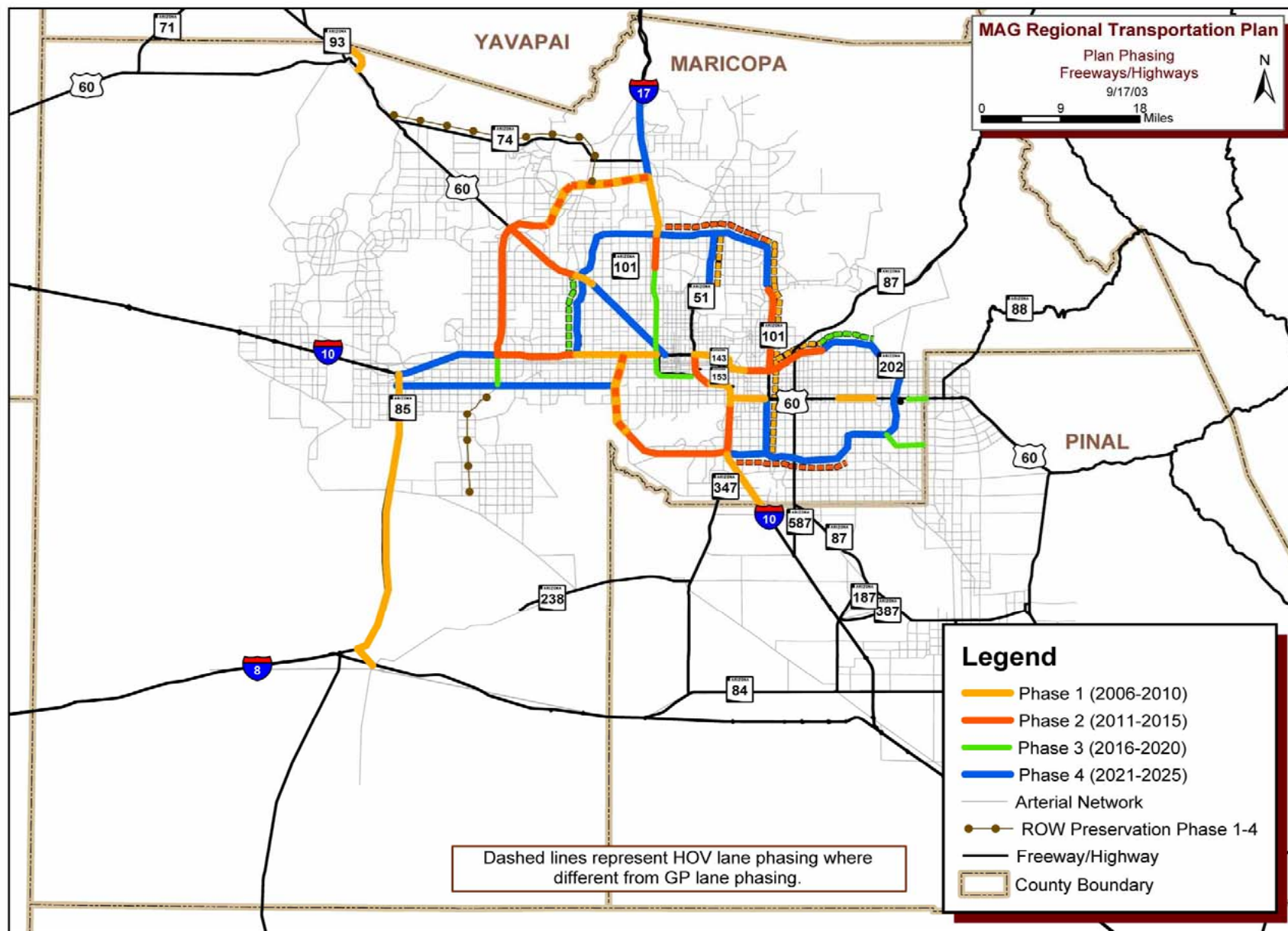
Plan Phasing Factors

The preparation of the phasing plan considered a number of factors. These factors responded to the goals and objectives addressed in the plan analysis and evaluation process. The factors considered in phasing the elements of the RTP are:

- *Traffic demand and congestion*
- *System continuity*
- *Revenue availability*
- *Bonding capacity and strategies*
- *Cost*
- *Project development process*
- *Project readiness*
- *Concurrent progress on multiple projects*

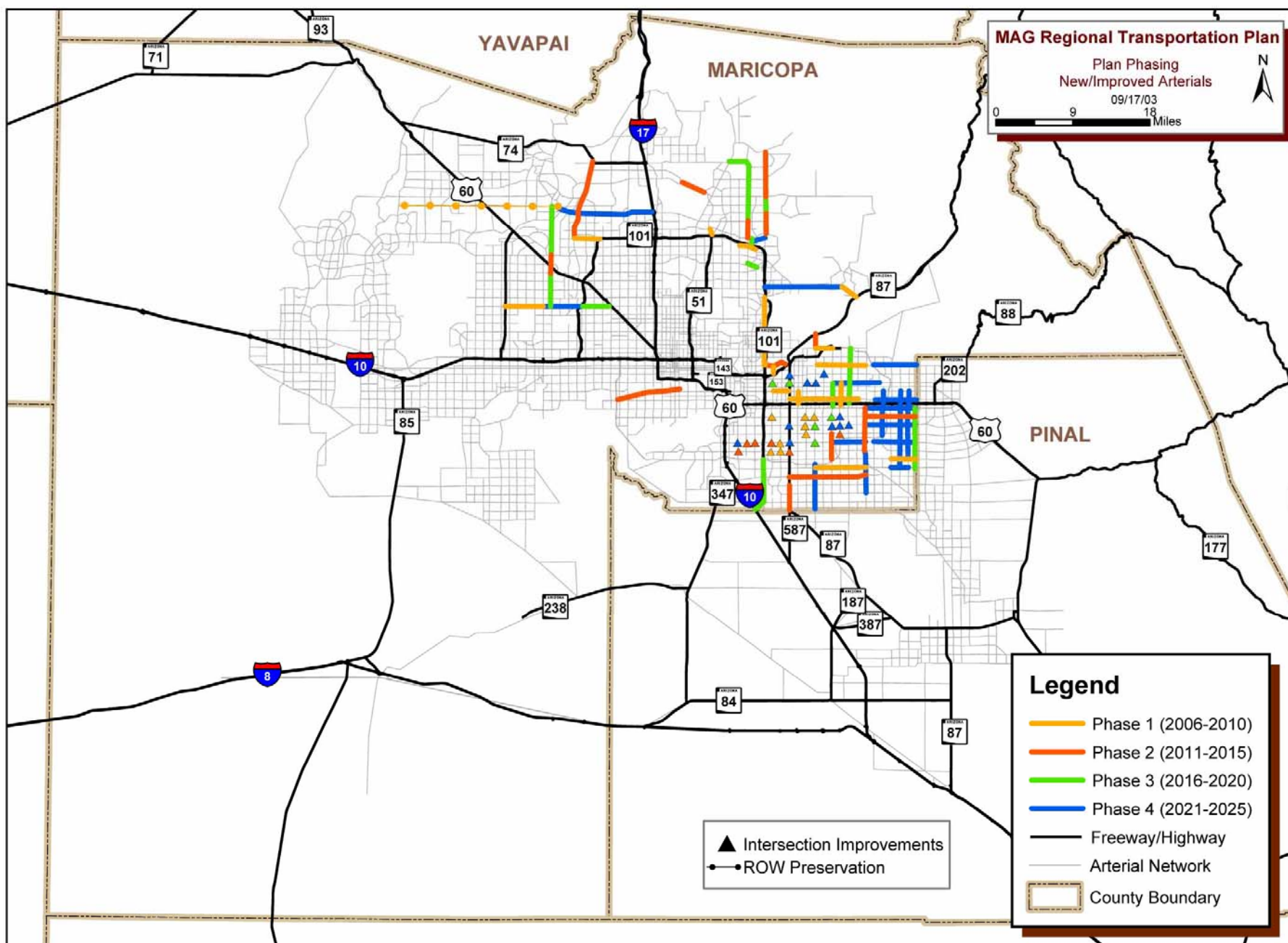
Phasing for each RTP component is shown in Figures 5-17 through 5-21.

Figure 5-17



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Figure 5-18



PROPOSED SUPER GRID AND RURAL SERVICE Draft Plan Phasing, September 9, 2003

Figure 5-19

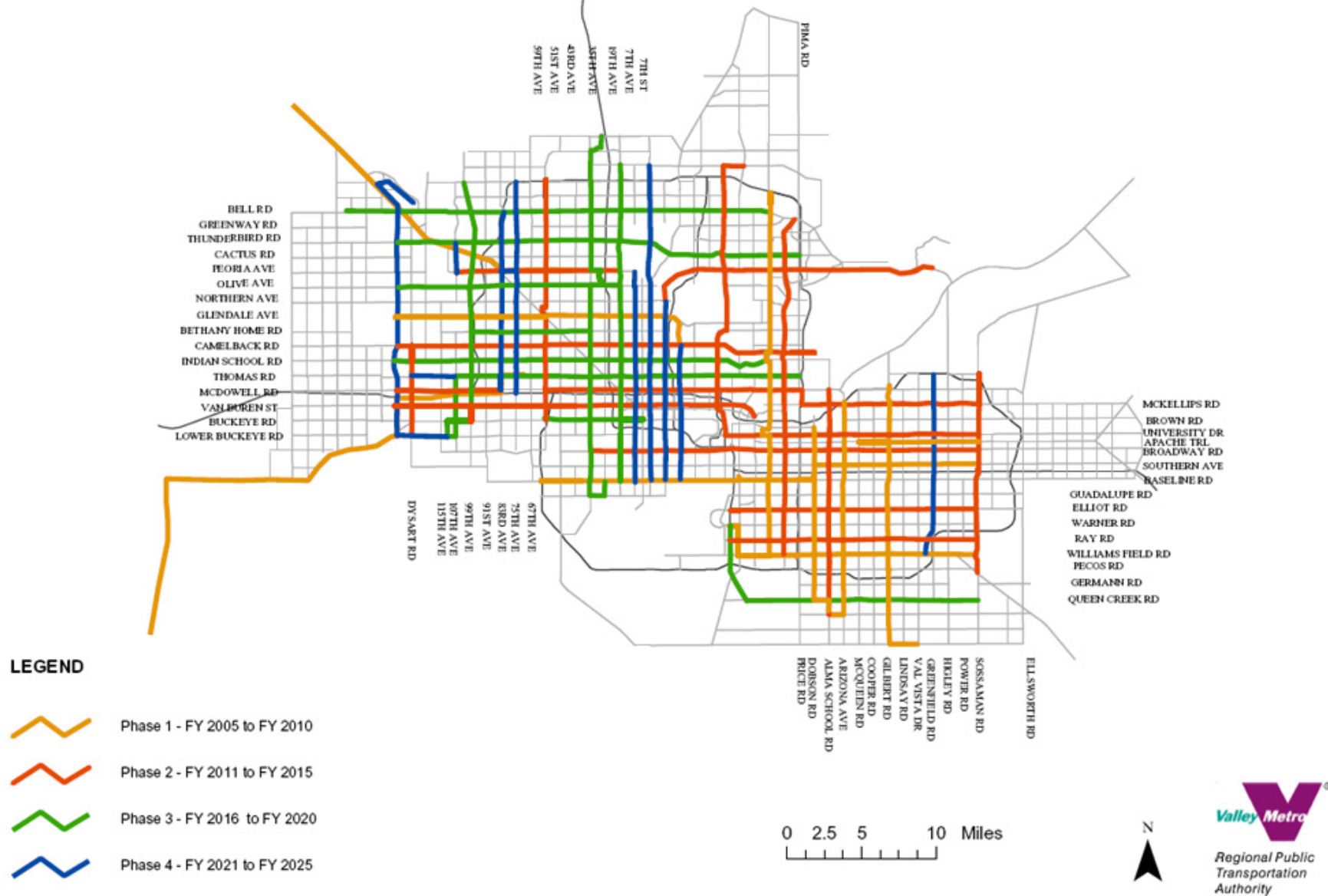


Figure 5-20



Figure 5-21



5.5 Motor Freight

MAG is completing a regional freight assessment study to provide a base line for analysis of current and future needs for regional freight infrastructure.

The movement of goods into, within, and out of the region is vital to the local economy. The movement of goods is conducted through the utilization of multiple modes of transport, such as air, pipeline, water, truck, rail, or other non-traditional means. Freight transport involves a complexity of networks and players who use a variety of methods, modes, available information technologies, and equipment to move raw materials, semi-processed and processed goods through regional, national and international markets for the purpose of commerce.

Regional Freight Infrastructure

Collectively, within the MAG Region, the regional highway network, the regional arterial network, railroads, airports, pipelines, freight terminals, warehouses, and intermodal facilities essentially comprise what is commonly referred to as the regional transportation system's overall "freight infrastructure." Figure 30 displays the current freight infrastructure system that is responsible for facilitating the goods movement process within and throughout the MAG Region.

Freight in the MAG Region

For purposes of analysis, MAG was able to identify freight movements in and out of Maricopa County to other areas of the United States. The database provides detailed information on the number of tons moving into and out of the region, and is focused on the primary categories of freight modes, commodities, and the origin and destination of goods.

As displayed by Figure 5-22, when considering all aggregate freight flows that take place into, out of, and within the MAG Region, 91.2 percent of all movements take place by truck, 8.5 percent occurred by rail, and the remaining 0.3 percent was generated by air.

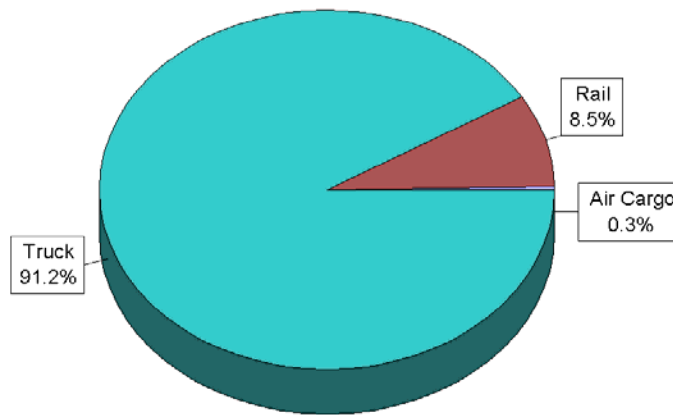
Some of the most notable observations on freight movements in the region substantiate the fact that the MAG Region receives more freight than it exports to other areas, and that the trucking industry maintains a key role in the transporting of goods into, within, and out of the region.

Trucking

Trucks are responsible for moving the bulk share of freight within our region's cities and towns, and their ability to operate in an efficient environment is crucial to maintaining the regional economy. From a freight perspective, the trucking industry is responsible for bringing in raw materials and processed goods for manufacturing; transporting freight to and from intermodal facilities; distributing goods to warehouses and retail locations; and delivering goods to businesses and consumers.

In 2001, over 91 percent of total freight flows into, out of, and within the MAG Region took place by the use of a truck.

Figure 5-22
TOTAL FREIGHT FLOWS INTO, OUT OF, AND WITHIN
THE MAG REGION BY MODE



Source: Reebie Associates, Maricopa Association of Governments

Rail

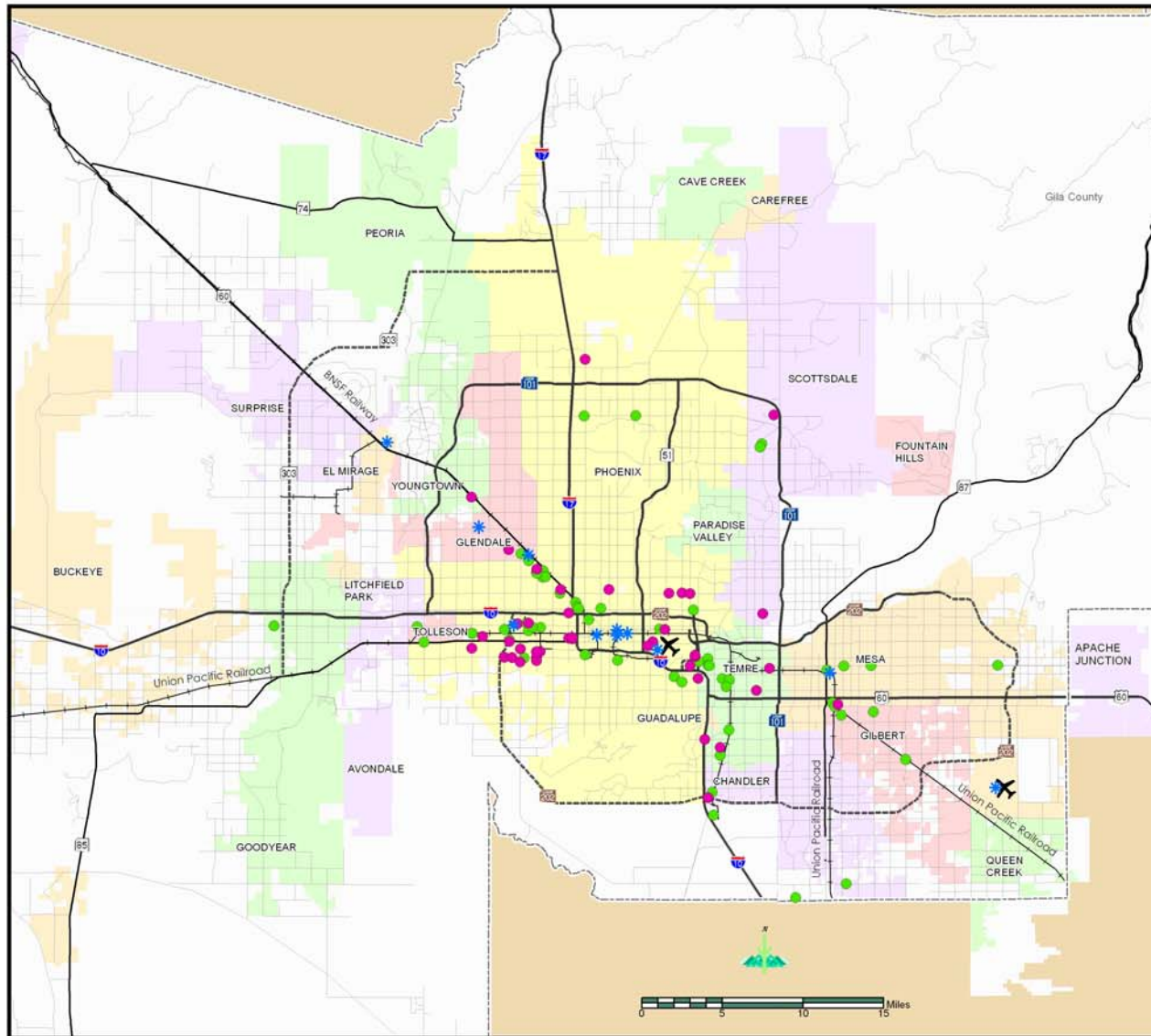
The railroad industry plays a major part in the national and regional economy, and transports certain types of goods throughout the country that would not be cost-effective or feasible to be hauled by other types of freight modes, such as truck, air or pipeline. Railroads in the United States are essentially transporters of bulk quantity goods, which are usually hauled by multiple train carloads over long distances. Trains are often the mode of choice for low value, bulk commodities that are not extremely time sensitive.

At present, there are a total of three operational railroads in the MAG Region. These railroads include the Burlington Northern and Santa Fe Railway (BNSF), the Union Pacific Railroad (UP), and the Arizona and California Railroad (ARZC). The BNSF and the UP are classified as Class I carriers, whereas the ARZC is considered to be an active Short Line, or Line Haul railroad. As of 2003, the BNSF maintained approximately 70 miles of active track in the MAG Region, the UP maintained a total of approximately 180 miles of active track, and the ARZC maintained a total of about 27 miles of active track.

Air Cargo

The Air Cargo or “air freight” industry in the United States maintains a very important role in the overall freight transportation industry, and generates billions of dollars on an annual basis. Although the bulk share of goods that are transported in the U.S. by plane are relatively low in comparison to the truck and rail freight modes, the air cargo industry continues to play an important role in specific segments of the overall goods movement process. The industry serves a number of particular markets, which are primarily focused on time-sensitivity issues, accommodating high-value commodities, and goods that solely rely on air transport for a variety of reasons.

Figure 5-23
Regional Freight Infrastructure



MAG Regional Freight Assessment

Map 3
REGIONAL
FREIGHT
INFRASTRUCTURE

- Freight Terminals
- Warehouses
- ★ Intermodal Facilities
- Cargo Airports
- Existing Freeway/Expressway
- Planned Freeway/Expressway
- U.S. and State Highways
- Major Road
- Railroad

DRAFT

MAP
AREA

MARICOPA

MARICOPA
ASSOCIATION of
GOVERNMENTS

There are presently a total of 12 airports located throughout the Greater Phoenix Metropolitan Area of MAG. Of these airports, Phoenix Sky Harbor International and Williams Gateway are the primary airports that maintain functional air cargo operations that significantly contribute to the regional economy. Sky Harbor International and Williams Gateway are the largest airports in the MAG Region, and maintain considerably active schedules for inbound and outbound air freight.

At present, Sky Harbor International Airport maintains four active air cargo facilities on the west side of the airport, which provide non-integrated and integrated air cargo services. Cargo Buildings A, B and C contain a total of 197,760 square feet of space, and collectively have a total of 103 air cargo bays to facilitate planes and air cargo.

At present, air cargo operations at Williams Gateway are comprised of specialized services, and are essentially comprised of unscheduled charter flights. Future dedicated air cargo facilities have been planned for east and west sides of the airport, and there is a planned expansion of one of the airport's runways to effectively accommodate air cargo aircraft

In 2001, there was a total of 342,674 tons of inbound and outbound air cargo moving in and out of the MAG Region. Of this amount, 72.1 percent (247,172 tons) was inbound, and 27.9 percent (95,502) was outbound from the region. Approximately 0.3 percent of all inbound and outbound freight movements within the MAG Region were conducted by air.

Next Steps in the Regional Freight Planning Process

A regional freight assessment will be completed in 2003. The Maricopa Association of Governments will next focus on formulating a comprehensive freight plan. The organization and structure of freight planning including infrastructure planning, existing capacities and future demand will be considered. Similar to aviation facilities planning, the establishment of a regional policy advisory committee comprised of MAG member agencies may be considered to lead regional efforts. A "Freight Policy Committee" could make recommendations on projects and capital improvements needed to support regional freight infrastructure needs.

Coordination with transportation planning and the Regional Transportation Plan is considered critical. The patterns of freight traffic, the infrastructure needs to facilitate freight movement across the region are incorporated in RTP modeling and demand analyses.

5.6 Aviation

The Phoenix metropolitan area is served by a full range of aviation facilities. Planning for the expansion of the region's facilities is conducted by MAG. MAG has been conducting regional aviation system planning for 25 years, having adopted plans in 1979, 1986 and 1993. The Agency is now in the midst of updating the Regional Aviation System Plan (RASP).

The Plan is a long-range strategic plan that focuses upon the major airport improvements and aviation policies that are needed to meet future demand. It is used as a blue-print to guide investment decisions and policy actions for the development of the airport system.

Obtaining input during the early phases of the planning process on the airport development alternatives and the criteria to be used to evaluate those alternatives is particularly valued.¹

¹ Maricopa Association of Governments, Regional Aviation System Plan Update Status Report, March 8, 2002

Existing Regional Aviation System

An inventory of the 16 airports, illustrated in Figure 5-24, in the region was prepared in order to document the existing facilities available and their traffic handling capabilities. Careful attention is also being focused on Luke Air Force Base to ensure that the development of the civilian airport system does not impair Luke's mission.

Projected Aviation Demand – 2025

The MAG RASP Update has developed a set of forecasts (Table 5-3) of air passenger boardings, general aviation based aircraft, aircraft operations and air cargo to the year 2025. For the region overall the 2000 and 2025 activity levels are noted below:

Table 5-3²
Base Year and Forecasts of Aviation Activity
in the MAG Region

Measure of Demand	Activity in 2000	Activity in 2025
Air Passenger Boardings	17.6 million	31.6 to 39.6 million
Take-offs and Landings	2.4 million	4.4 million
Based aircraft	4,300	7,600
Tons of Air Cargo Enplaned	374,000	1.4 - 2.4 million

Demand Capacity of Existing Regional Aviation System

To identify the need for potential improvements in the MAG Region, the MAG RASP Update compares the forecasted traffic level at each airport with its yearly aircraft traffic handling capability, known as Annual Service Volume (ASV). Table 5-4 compares the forecasted traffic with the Annual Service Volume. Where the traffic exceeds the Annual Service Volume, it is usually recommended that a capacity expansion project be considered at the airport where feasible. Some airport sponsors may not choose to expand their facility because they are physically and or fiscally constrained.

² MAG Regional Aviation System Plan Update Status Report, March, 2002

Figure 5-24
Regional Aviation Facilities

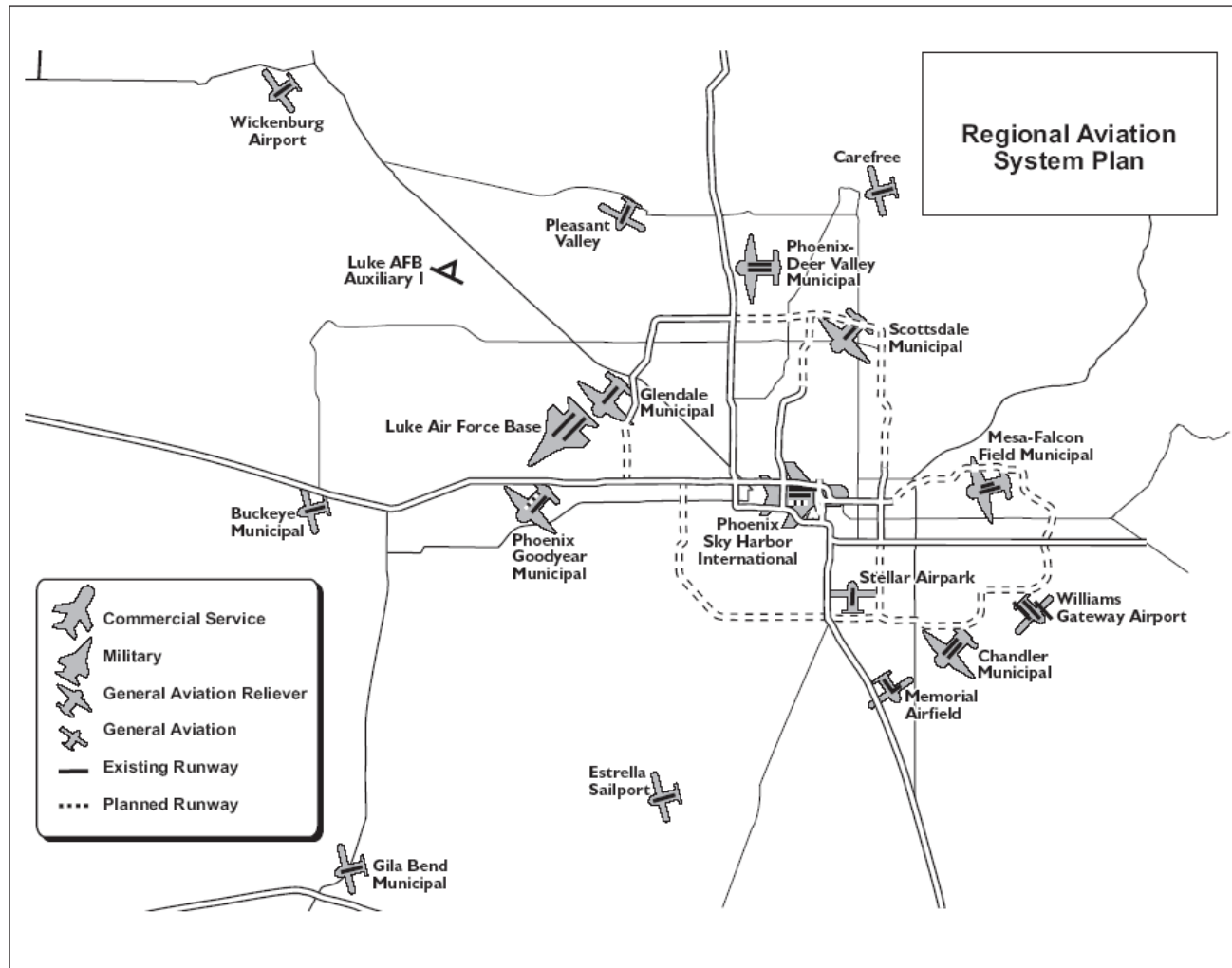


Table 5-4³
Comparison of Service Capacity to Forecasted Traffic

Airport	Annual Service Volume	2025 Airport Forecast
Buckeye	315,560	215,220
Chandler	460,000	514,500
Estrella Sailport	120,000	16,500
Gila Bend	212,797	57,800
Glendale	257,972	197,000
Memorial	100,000	5,500
Mesa Falcon Field	443,000	472,100
Phoenix-Deer Valley	606,000	640,600
Phoenix-Goodyear	304,916	334,200
Phoenix Sky Harbor	660,000	673,000 - 841,000
Pleasant Valley	120,000	134,300
Scottsdale	200,000	262,600
Sky Ranch Carefree	174,000	13,000
Stellar	286,700	78,400
Wickenburg	245,000	38,100
Williams Gateway	410,000	420,300

Alternatives To Address Deficiencies

MAG is currently in the process of identifying a set of airport development alternatives for meeting future demand. Wilbur Smith and Associates have drafted four prototype alternatives and identified the some criteria used to evaluate them. MAG is seeking input from the public on the definition and evaluation of these alternatives. The potential alternatives and evaluation criteria are noted below.

1. Do-Nothing - Status quo alternative

- Assumes that projects programmed in ADOT's most recent CIP are implemented.
- Provides a base case for comparison to other alternative scenarios.
- Assumes existing regulations, ordinances, technology, and facilities remain in place.
- Assumes implementation of Northwest 2000.

2. Improved Technology

- Most significant deficiency is operational capacity at many airports.

³ MAG Regional Aviation System Plan Update Status Report, March, 2002

- FAA's capacity benchmark analysis indicates a potential increase in operational capacity due to the implementation of technological and procedural improvements anticipated over the next 10 years.
- Improvements to technology will be evaluated as they relate to each airport.
- Most relevant to commercial service airports in system.

3. Maximized Development of Existing System

- Evaluate which airports can accommodate additional runways to improve the region's operational capacity, a key deficiency of the existing system, including Phoenix-Sky Harbor's fourth runway.
- Recognize some existing constraints and analyze the feasibility of improvements (Scottsdale & Mesa).
- Assume all projects identified in ADOT's most recent CIP are implemented.
- Assume all airports will meet standards and will develop needed facilities to accommodate projected demand through 2025.
- Determine policies in place that restrict airport development in the region

4. New Airport Development (general aviation and/or commercial service)

- Assumes no new runways at existing airports.
- Will review previous study results for proposed new airports in Northwest, Southeast, and Northeast portions of the region.
- Reassign portion of demand from other airports to new airport(s) to determine facility needs of existing airports.

The alternatives will be evaluated potentially based on the following factors:

- Environmental consequences (especially noise and air quality impacts, as determined on system planning level of detail).
- Cost of alternative.
- Delay impacts (improvement and costs of delay).
- User convenience.
- Access improvement needs.
- Airspace compatibility (special attention will be focused upon the airspace impacts of projects on Luke Air Force Base to ensure that it can carry out its mission).
- Ease of implementation.
- Title VI impacts (as available from existing documentation).

6. Regional Wastewater Treatment

Existing and future regional wastewater treatment conditions including analysis of demand and capacity are reviewed in this chapter.

The process of treating wastewater involves two different types of facilities: wastewater treatment plants (WWTP) and water reclamation facilities (WRF). Sometimes the water reclamation facility is the final destination for wastewater, and other times it is ultimately transferred to a wastewater treatment plant. Generally, water reclamation facilities process wastewater for use by golf courses, and for other similar landscaping uses. Currently in Maricopa County there are 22 wastewater treatment plants and 19 water reclamation facilities that process residential and commercial wastewater. Municipalities primarily operate these facilities, although there are a few privately owned facilities. A map of these facilities along with trunk lines for the metro area is shown in Figure 6-1.

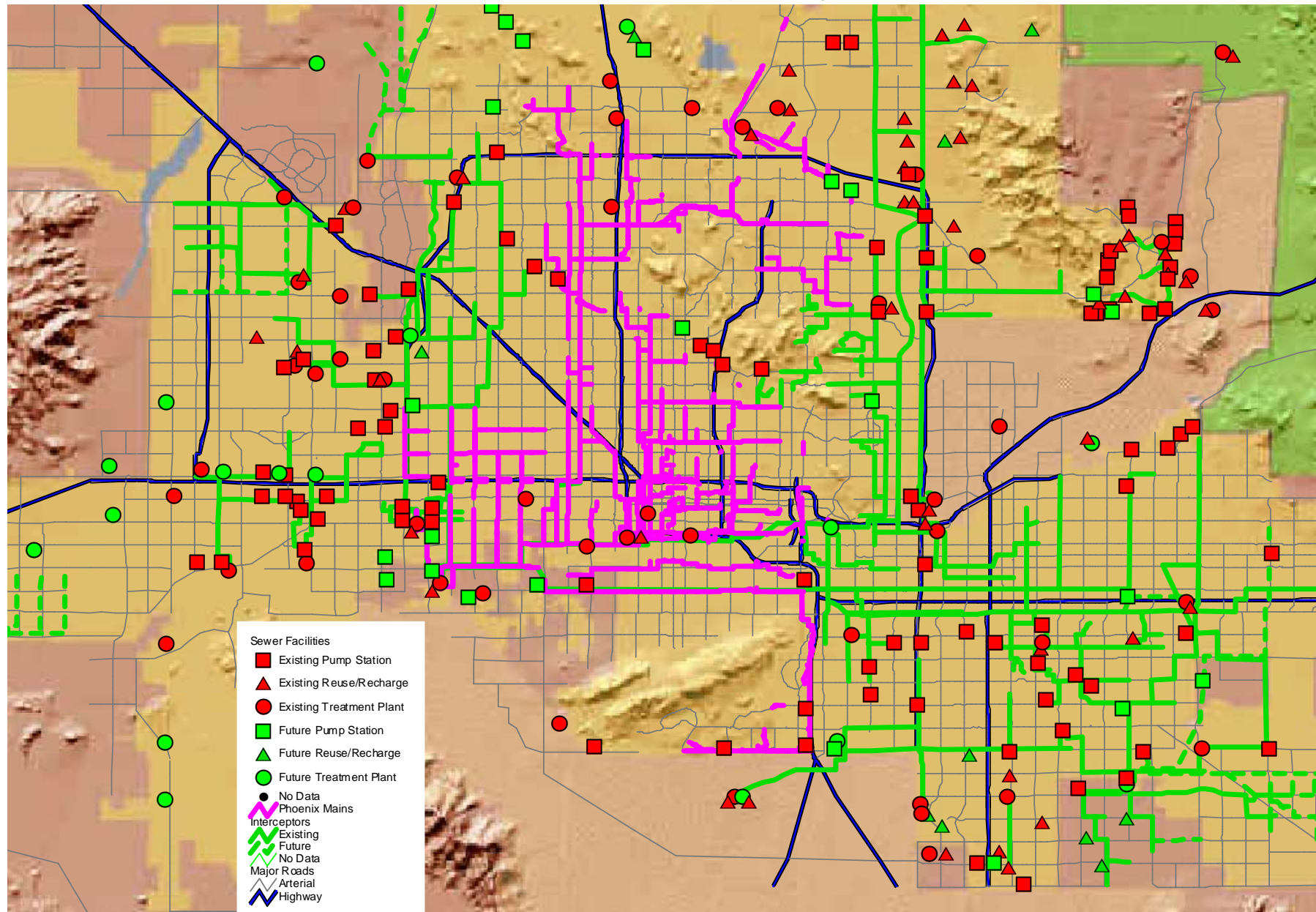
There are three categories of operators shown in the table: municipal, multi-city sub-regional operating groups (SROG), and private companies. In some cases where the operator is a municipality, plants are operated by the community in which they are located; however in other cases a neighboring municipality operates them. Private companies are responsible for wastewater treatment in Carefree, Cave Creek, Youngtown and Litchfield Park. Additionally, private companies operate small package plants serving individual developments in Buckeye, Glendale, Peoria and in the unincorporated county.

The capacity listed is specific to each community. Capacities are in terms of millions of gallons per day. In total, the County has a current (2002) capacity of 411.68 mgd, and a projected future capacity of 946.66 mgd. This capacity includes both wastewater treatment plants and water reclamation facilities. Additionally, it is important to note that in some communities many of the residents use septic systems and are not served by a municipal wastewater provider. Although it is unlikely that this will be the case for new developments, not all existing residents require wastewater service.

6.1 Projected Wastewater Capacity

Table 6-1 shows a timeline of available capacity by facility in 2000, 2010, 2025, 2040 and at build out. Additional capacity in future years may come from expansions at existing plants or from construction of new facilities. The data in Figure 2 corresponds to the ultimate capacity shown in Figure 1, but includes details on individual plants and allocates supply additions to particular time frames.

Figure 6-1
Existing and Future Pump Station, Reuse/Recharge, and Treatment Plant
Locations in Maricopa County



**TABLE 6-1
CURRENT AND PROJECTED WASTEWATER TREATMENT CAPACITY**

City	Facility	Capacity (mgd)				Buildout
		2000	2010	2025	2040	
Avondale						
	Avondale WWTP	3.5	6.4	6	20	20
	Northside WRP (Planned)	0	6	6	6	6
	Package WWTP (Planned)	0	0	0	1	1
Buckeye						
	Buckeye WWTP	0.6	2	2	2	2
	Sundance WWTP (Planned)	0	1.2	3.6	3.6	3.6
	Blue Horizons WWTP (Planned)	0	0.8	2	2	2
	Verrado WRF (Planned)	0	0.45	3.35	3.35	3.35
Carefree (Black Mountain Sewer Corporation)						
	BMSC WWTP	0.12	0.12	0.16	0.16	0.16
	BMSC Treatment Agreement with Scottsdale ¹	0.319	0.319	0.319	1	1
Cave Creek						
	Rancho Manana WWTP	0.23	0.23	0.23	0.23	0.23
Chandler						
		26.3	36.3	41.3	41.3	41.3
	Ocotillo WRF	10	10	10	10	10
	Airport WRF	5	15	20	20	20
	Industrial WWTP	2.8	2.8	2.8	2.8	2.8
	Lone Butte WWTP (GRIC)	8.5	8.5	8.5	8.5	8.5
El Mirage						
	El Mirage WWTP	0.25	3.6	3.6	3.6	3.6
Fort McDowell Yavapai Nation						
	Casino WWTP	0.06	0	0	0	0
	Bee Line Hwy WWTP (Planned)	0	0.25	1	1	1
Fountain Hills						
	Fountain Hills WWTP	1.9	3.2	3.2	3.2	3.2
Gila Bend						
	Gila Bend WWTP	0.13	0.13	0.7	0.7	0.7
GRIC						
	Lone Butte WWTP	2.2	2.2	2.2	2.2	2.2
	Wild Horse Pass WRP (Planned)	0	2	10	10	10
	Vee Quiva WWTP	0.1	0.1	0.1	0.1	0.1

¹ Maximum ultimate capacity of 1.0 would require additional payments to City of Scottsdale.

**TABLE 6-1 (Cont.)
CURRENT AND PROJECTED WASTEWATER TREATMENT CAPACITY**

City	Facility	Capacity (mgd)				Buildout
		2000	2010	2025	2040	
Gilbert						
	Mesa Gilbert South WRF (Planned)	0	8	19	19	19
	Neely WRF	8.5	11	11	11	11
Glendale						
	West Area WRF	4.3	15	15	15	15
	Arrowhead Ranch WRF	4.5	4.5	4.5	4.5	4.5
	91st Ave WWTP	13.2	13.2	13.2	13.2	13.2
	Desert Gardens I WWTP	0.05	0.05	0.05	0.05	0.05
	Casitas Bonitas WWTP (will go to Sarival WRF)	0.05	0	0	0	0
	Desert Gardens II WWTP (Planned)	0	0	0.6	0.6	0.6
	AWC Russell Ranch WWTP (Planned)	0	0.06	0.4	0.4	0.4
Goodyear						
	Gila River Basin-Cotton Lane WRF (Planned)	0	0	0	4	4
	Palm Valley WRF (Planned)	0	8.2	8.2	8.2	8.2
	Sarival WRF (Planned)	0	8.2	8.2	8.2	8.2
	157th Ave Goodyear WWTP	3	11	15	15	15
	Rainbow Valley (Lum Basin) WRF (Planned)	0	4	9.2	9.2	9.2
	Waterman Basin WRF (Planned)	0	2.8	5.5	5.5	22
	Corgett Basin WRF	0.8	1.8	3	3	3
Guadalupe						
	91st Ave WWTP (via Tempe)	0.7	0.7	0.7	0.7	0.7
Litchfield Park- (Litchfield Park Service Company)						
	157th Ave WWTP	1.4	0	0	0	0
	Palm Valley WRF	0	0.8	8.2	8.2	8.2
	Sarival WRF (Planned)	0	4.1	8.2	8.2	8.2
Mesa						
	Mesa Gilbert South WRF (Planned)	0	3	24	24	30
	91st Ave WWTP	29.22	29.22	29.22	29.22	29.22
	Northwest WRP	18	18	18	30	30
	Southeast WRP	8	8	8	16	16
Paradise Valley						
	23rd Ave WWTP (treatment agreement w/Phoenix)	0.42	0.42	0.42	0.42	0.42
	91st Ave WWTP (treatment agreement w/Phoenix)	0.5	0.5	0.5	0.5	0.5
	Treatment agreement with Scottsdale	0.88	0.88	0.88	0.88	0.88
Peoria						
	Tolleson WWTP	9.4	9.4	13	13	13
	Beardsley WWTP	3	3	16	16	16
	South Peoria WRP (Planned)	0	2.8	2.8	13	13
	Jomax WRF (Planned)	0	6.7	6.7	9	9
	Quintero WRP (Planned)	0	0.07	0.07	0.07	0.15
	Paddleford WRP (Planned)	0	0	1	1	1
	Saddleback WRP (Planned)	0	0	0.9	0.9	0.9
	Pleasant Harbor WRP	0.063	0.063	0.189	0.189	0.189

**TABLE 6-1 (Cont.)
CURRENT AND PROJECTED WASTEWATER TREATMENT CAPACITY**

City	Facility	Capacity (mgd)				Buildout
		2000	2010	2025	2040	
Phoenix						
	Cave Creek WRP	8	8	8	8	32
	North Gateway WRP (Planned)	0	4	32	32	32
	23rd Avenue WWTP	63	63	63	63	78
	91st Avenue WWTP	87.67	112.8	144.8	240	240
Queen Creek						
	Mesa Gilbert South WRF (Planned)	0	4	4	4	4
	Southeast WRP	4	0	0	0	0
SRPMIC						
	Northwest WRP	6	6	6	6	6
	Roadrunner WWTP	0.1	0.1	0.1	0.1	0.1
	Victory Acres WWTP	0.4	0.4	0.4	0.4	0.4
Scottsdale						
	Gainey Ranch WRP	1.7	1.7	1.7	1.7	1.7
	Scottsdale Water Campus WRP	12	16	24	24	24
	91st Ave WWTP	13.13	20.25	20.25	20.25	20.25
Sun City						
	Tolleson WWTP	5.2	5.2	7.7	7.7	7.7
Surprise						
	North Surprise WWTP (Planned)	0	na	na	na	na
	South Surprise WWTP	3.2	19.2	36	36	36
	Litchfield Road WWTP	1.32	0	0	0	0
Tempe (Use Phoenix)						
	Kyrene WRP	4.5	4.5	10	10	10
	91st Ave WWTP (plus alternative Rio Salado WRP)	18.53	29.03	32.5	32.5	32.5
Tolleson						
	Tolleson WWTP	2.9	2.9	4.2	4.2	4.2
Youngtown (Arizona-American Water Company)						
	Tolleson WWTP	0.3	0.3	0.3	0.3	0.3
Wickenburg						
	Wickenburg WWTP	0.8	1.2	1.2	1.2	1.2
Unincorporated Maricopa County						
	Anthem WWTP	0.5	0.5	4.5	4.5	4.5
	Belmont WWTP (Planned)	0	4.5	4.5	4.5	4.5
	Lakeland Village WWTP (Planned)	0	2.9	2.9	2.9	2.9
	Mountainwood (Planned-Use Gilbert)	0	0.37	0.37	0.37	0.37
	Rio Verde Area WWTP	0.3	0.6	0.9	0.9	0.9
	Sun City West	2.14	3.4	6.44	6.44	6.44
	Sun Lakes	2.4	2.4	2.4	2.4	2.4
	Wigwam Creek	2.4	2.4	2.4	2.4	2.4
REGIONAL TOTAL		408.5	592.7	799.7	946.6	1,008.2

The 2000 capacity of 408.5 mgd is projected to expand by 45 percent by 2010 to 592.7 mgd, and by an additional 35 percent by 2025 to 799.7 mgd, based on known improvements and ultimate facility capacities. The projected build out capacity of all existing and planned facilities is 1,008.2 mgd. The amount of time that it will take to use up this capacity will depend on the projected rate of population growth.

6.2 Projected Wastewater Generation

Table 6-2 summarizes projected wastewater by municipal planning area. Projections directly correspond to total population growth rates by community.

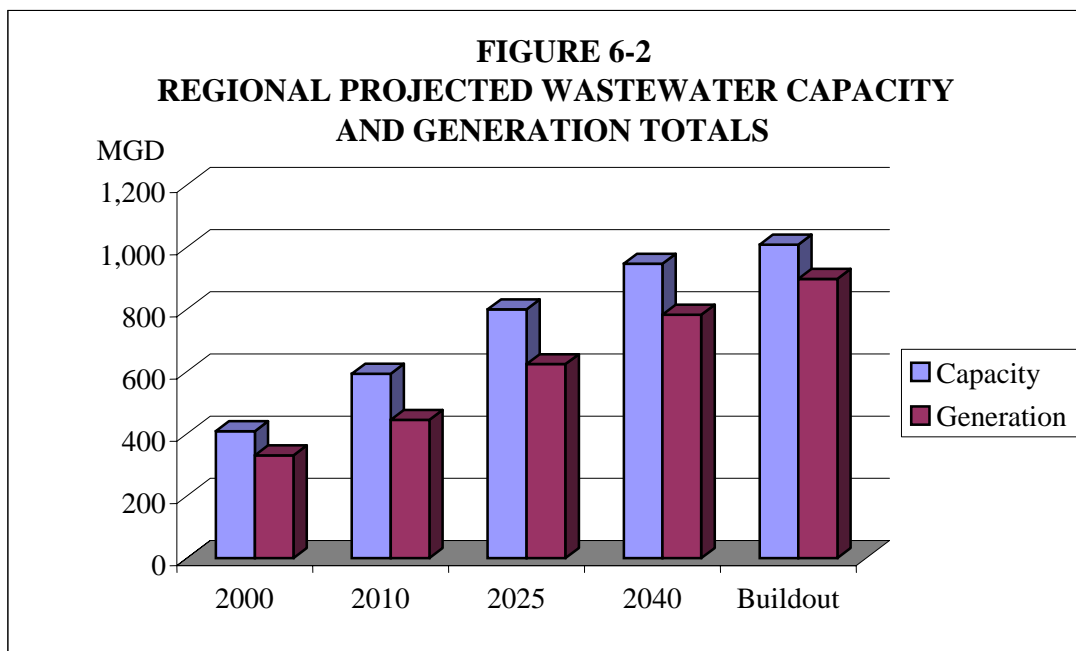
TABLE 6-2
PROJECTED WASTEWATER GENERATION BY MPA
MILLIONS OF GALLONS PER DAY

City	2000	2010	2025	2040	Buildout
Avondale	3.78	7.11	10.90	11.48	11.50
Buckeye	1.67	7.66	32.82	58.68	83.79
Carefree	0.27	0.37	0.45	0.45	0.46
Cave Creek	0.39	0.52	0.95	1.33	1.33
Chandler	16.00	25.00	27.51	27.83	28.01
El Mirage	0.77	3.05	4.22	4.52	4.52
Fountain Hills	1.85	2.23	1.80	1.83	1.84
Gila Bend	0.21	0.26	1.08	5.87	11.02
Gila River	0.10	2.10	10.10	10.10	10.10
Gilbert	9.14	16.94	22.56	23.02	24.94
Glendale	22.34	28.61	30.10	30.40	30.57
Goodyear	2.12	6.66	24.87	36.62	37.38
Guadalupe	0.52	0.52	0.52	0.53	0.53
Litchfield Park	0.38	0.88	1.44	1.48	1.50
Mesa	49.70	60.21	71.11	73.01	73.27
Maricopa County	8.59	9.23	15.01	61.61	134.45
Paradise Valley	1.56	1.81	1.98	2.04	2.07
Peoria	11.41	16.56	30.00	38.35	39.18
Phoenix	142.48	179.43	220.86	238.55	241.66
Queen Creek	0.89	1.94	8.46	9.36	9.40
Salt River	4.25	4.31	4.32	4.32	4.32
Scottsdale	25.17	31.69	35.80	36.26	36.59
Surprise	3.77	11.94	27.81	64.44	67.76
Tempe	20.97	23.17	33.70	34.44	34.67
Tolleson	1.20	1.32	3.85	3.86	3.86
Wickenburg	0.44	0.45	0.95	2.19	2.21
Youngtown	0.27	0.50	0.61	0.66	0.67
Total	330.24	444.48	623.73	783.24	897.60

Source: Maricopa Association of Governments Draft 2 Projections, 2002; Applied Economics, 2002.

6.3 Regional Net Capacity

On a regional basis, projected treatment capacity exceeds wastewater generation in all time periods (Figure 6-2). In 2010 and 2025, capacity exceeds generation by 28 to 33 percent. In 2040, excess capacity is reduced to 21 percent of total regional generation, and by build out, excess capacity is estimated at 12 percent. Even at 12 percent excess capacity, it appears that as a region Maricopa County does not have long-term infrastructure constraints in terms of wastewater treatment. However, at the local level there are additional capacity needs in some communities in all of the time periods.



6.4 Local Net Capacity

Net capacity (treatment capacity less wastewater generation) at the community level is shown in Figure 6-3. Note that these are simply order of magnitude estimates and very small additional capacity needs are not of great concern.

FIGURE 6-3
PROJECTED NET CAPACITY BY MPA*
MILLIONS OF GALLONS PER DAY

City	2000	2010	2025	2040	Buildout
Avondale	(0.28)	5.29	1.51	15.52	15.50
Buckeye	(1.07)	(3.21)	(21.87)	(47.73)	(72.84)
Carefree	0.17	0.07	0.03	0.71	0.70
Cave Creek	(0.16)	(0.29)	(0.71)	(1.10)	(1.10)
Chandler	10.30	11.30	13.79	13.47	13.29
El Mirage	(0.52)	0.55	(0.62)	(0.92)	(0.92)
Fountain Hills	0.05	0.97	1.40	1.37	1.36
Gila Bend	(0.08)	(0.13)	(0.38)	(5.17)	(10.32)
Gila River	2.20	2.20	2.20	2.20	2.20
Gilbert	(0.64)	2.06	7.44	6.98	5.06
Glendale	(0.24)	4.20	3.65	3.35	3.18
Goodyear	1.68	29.34	24.24	16.48	32.22
Guadalupe	0.18	0.18	0.18	0.17	0.17
Litchfield Park	1.02	4.02	14.97	14.92	14.90
Mesa	5.52	(1.99)	8.11	26.21	31.95
Maricopa County**	4.41	13.29	18.10	(28.50)	(101.34)
Paradise Valley	0.24	(0.01)	(0.18)	(0.24)	(0.27)
Peoria	1.05	5.47	10.66	14.81	14.06
Phoenix	16.19	8.37	26.94	104.45	140.34
Queen Creek	3.11	2.06	(4.46)	(5.36)	(5.40)
Salt River	2.25	2.19	2.19	2.19	2.18
Scottsdale	1.66	6.26	10.16	9.69	9.36
Surprise	0.75	7.26	8.20	(28.44)	(31.76)
Tempe	2.06	10.36	8.80	8.06	7.83
Tolleson	1.70	1.58	0.35	0.34	0.34
Wickenburg	0.36	0.75	0.25	(0.99)	(1.01)
Youngtown	0.03	(0.20)	(0.31)	(0.36)	(0.37)
Total	51.95	111.94	134.62	122.10	69.31

Source: Maricopa Association of Governments Draft 2 Projections, 2002.

*Net capacity = Total Capacity - Projected Generation

**Includes Sun City and Fort McDowell Yavapai Nation.

Additional capacity needs are projected in all time periods in Buckeye. By 2040, generation will exceed capacity by 47.73 million gallons per day and by build out the generation will exceed capacity by an estimated 72.84 mgd. To put this in perspective, the Town's current capacity is only 0.6 mgd. Buckeye has a number of very large master planned communities slated for future development. The existing plant, which can be expanded to 2 mgd, serves only the core population in the developed portion of the community. The Town is aware of the impending additional capacity needs and is planning to negotiate agreements with developers for package plants as these large master plans are approved. There are currently plans in place with three large developments for additional treatment plants. The estimated cost to build 72.84 mgd of additional capacity is \$1.2 billion, including the collection system, treatment and effluent disposal. However, some of this cost would likely be born by developers. In the shorter term, the cost to build capacity required by 2010 is estimated at \$53.0 million.

Cave Creek also has small additional capacity needs in all time periods. The current system for the portion of the town that is served by a wastewater system is 0.23 mgd and no expansions are projected. However, given the increasing capacity needs, expansions will likely be necessary before 2010. The estimated cost to meet the capacity requirements for 2010 would be \$4.7 million. A total investment of \$18.1 million would be required to service the projected build out population in Cave Creek.

Gila Bend is another small community with additional capacity needs increasing from 0.13 mgd in 2010 to 10.32 mgd by build out. The current capacity of Gila Bend's system is 0.13 mgd with an expansion to 0.7 mgd planned in 2020. This expansion may need to be accelerated if population growth keeps up with MAG projections. Given Gila Bend's remote location, purchasing capacity from a neighboring community is not an option. The total estimated infrastructure investment required by 2010 is estimated at \$2.2 million. At build out, the cost to provide 10.32 mgd additional capacity would be \$170.2 million, including the planned expansion from 0.13 mgd to 0.7 mgd.

El Mirage is projected to have additional capacity needs of 0.62 mgd by 2025, increasing to 0.92 mgd by 2040. The El Mirage WWTP has a planned expansion that will provide excess capacity in 2010, but long-term population growth will exceed the capacity of that plant. Given the magnitude of the additional capacity needs (less than 1 mgd), it may be possible that the existing treatment plant could be further expanded from its planned capacity of 3.6 mgd to meet additional demand. The total cost of the additional 0.92 mgd required to meet demand by 2040 is estimated at \$15.2 million.

Paradise Valley has small additional capacity needs beginning in the 2010 time period. By 2040, the additional needed capacity is projected at 0.24 mgd. Although the town is nearly built out now, the high price of land is fueling redevelopment activity. In some cases, older homes on large multi-acre lots are being redeveloped into multiple homes on smaller one acre lots, thereby increasing the amount of wastewater generation. However, since Paradise Valley relies on the regional treatment facility for residents who are not on septic, it would be possible to negotiate agreements with the City of Phoenix for additional flow capacity from the 23rd Avenue or 91st Avenue plants.

Mesa has a small additional capacity need of 1.99 mgd in 2010, but excess capacity in all other time periods. It is likely that this is simply a timing issue. The Mesa Gilbert South WRF is projected to come on-line in 2006 with a capacity of 3 mgd allocated to Mesa, increasing to 24 mgd by 2025. The Town of Gilbert will use 8 mgd of capacity at the new Mesa Gilbert South facility in 2006, which would give Gilbert excess capacity in 2010 that could possibly be re-allocated to Mesa.

Queen Creek is expected to experience additional capacity needs by the 2025 time period when their growth rate peaks. No expansions in capacity are planned at this time beyond the 4 mgd they plan to purchase from the Mesa-Gilbert South WRF this year. However, since Mesa has excess capacity in 2025 and 2040, it is likely that Queen Creek could purchase additional capacity as needed to meet long term increases in demand.

Despite rapid growth in the 2000 to 2010 period, Surprise is able to maintain excess capacity until 2040 based on planned expansions at the South Surprise WWTP. No capacity data was available for the planned North Surprise WWTP that will come on-line in 2005. The city will likely be able to cover the projected additional capacity needs of 31.76 mgd that is projected by

build out with this additional planned treatment facility. The estimated capital cost of building treatment capacity of 31.76 mgd would be \$524.0 million.

Wickenburg is expected to have small additional capacity needs of just less than 1 mgd, should they reach their projected population level of 33,200 by 2040. Given the remote location, Wickenburg does not have the option of purchasing capacity from another community. However, it is likely they could negotiate with developers for additional package plants to meet the small additional capacity needs in long-term capacity. The estimated cost of adding 1.01 mgd in treatment capacity required by build out is \$16.7 million. It is assumed this cost would be largely born by developers, either directly or through impact fees.

The small community of Youngtown is projected to experience additional capacity needs by 2010, despite relatively slow growth. They currently utilize 0.3 mgd at the Tolleson WWTP with no projected increases. Tolleson has a small amount of excess capacity that could possibly be re-allocated to Youngtown.

Unincorporated Maricopa County is projected to experience sizeable long-term additional capacity needs of 28.50 mgd by 2040 when population is projected at 615,500. A dramatic 312 percent increase in population in the unincorporated county is projected between 2025 and 2040. Since it is unclear where the specific geographic location of this additional needed capacity would be, it is also unclear where additional capacity would come from. However, some of the excess capacity at the regional level in 2040 could potentially be re-allocated to the appropriate locations. Alternatively, developers in the unincorporated county could be required to provide package plants, which is generally consistent with the way the County has handled wastewater treatment up to this point. The estimated cost to build the 28.5 mgd of additional capacity required by 2040 would be \$470.3 million, and an additional \$1.2 billion investment would be required to meet build out demands.

The only other major discrepancy is the substantial excess capacity that is projected for the City of Phoenix by 2040. A planned expansion at the 91st Avenue WWTP between 2025 and 2040 would boost the city's capacity from 248 mgd to 343 mgd, resulting in a projected surplus of 104.45 mgd by 2040. According to the City of Phoenix, projections used in this report for the years 2020 to build out under-project the historic growth experienced in wastewater generation and show more excess capacity than expected.

Conclusions

Overall, it appears that significant additional capacity needs in treatment capacity are isolated to rapidly growing communities on the urban periphery. However, some of these additional capacity needs are projected to occur in the near term, by 2010. In some cases it is possible to re-allocate capacity from regional facilities in neighboring communities such as in Queen Creek, Paradise Valley, Mesa and Youngtown.

In other cases such as Cave Creek and El Mirage where there are smaller additional capacity needs, but the communities are not served by regional facilities, expansion plans may need to be revised to accommodate slightly higher than anticipated growth rates.

When projected additional capacity needs are large and it is not possible to re-allocate capacity from regional treatment facilities, such as in Buckeye and Gila Bend, these communities will face substantial challenges in working with developers to ensure that the treatment needs of the rapidly growing resident base can be met. Given the magnitude of the additional capacity

needs in Buckeye, it will also be a challenge for Buckeye to avoid ending up with an unmanageable number of small package plants rather than a more comprehensive citywide system. The unincorporated county may face a similar challenge depending on the geographic distribution of growth and corresponding additional capacity needs.

7. Regional Solid Waste Management

The existing and future conditions of regional solid waste management are detailed in this chapter.

The process of disposing of solid waste involves three different types of facilities: transfer stations, landfills and material recovery facilities (MRFs). Some MRFs are combined with transfer stations where waste is sorted and transferred into trucks within the same physical facility for transport to landfills. Currently in Maricopa County there are 13 transfer stations, 6 MRFs and combination MRF/transfer stations and 7 landfills that process residential and commercial waste. These facilities are operated by a combination of public and private sector organizations. Figure 7-1 shows landfills, transfer stations and MRFs.

Landfills

An inventory of existing and planned landfill facilities and their service areas with corresponding ID numbers to Figure 7-1 are shown in Table 7-1. This inventory includes only landfills in Maricopa County and does not include private rubbish or construction debris landfills. Beginning in 1988, the County opened the first of four planned regional landfills. However, soon thereafter, the county got out of the regional landfill business selling the Northwest Regional Landfill in north Phoenix. Regional landfills opened to date include Northwest Regional, Southwest Regional and Butterfield Station. Waste Management Inc owns and operates both the Northwest Regional Landfill and Butterfield Station, while Allied Waste operates the Southwest Regional Landfill owned by the Buckeye Pollution Control Agency. These regional landfills are in remote areas along the urban periphery and each service a large part of the metro area.

TABLE 7-1
MARICOPA COUNTY LANDFILL INVENTORY

ID	Facility	Owner/Operator	Service Area	Estimated Yr of Closure
23	Butterfield Station	Waste Management	Gila River, Tempe, Phoenix, Chandler, Cave Creek, Carefree	2110
24	Northwest Regional	Waste Management	Surprise, El Mirage, Morristown, Aguila, Wickenburg, Deer Valley, Sun City, Peoria	2102
25	Southwest Regional	Allied Waste-operator/Buckeye Pollution Control - owner	Litchfield Park, Buckeye, Gila Bend/Avondale, Goodyear	2051
26	Chandler	City of Chandler	Chandler only	2006
27	Glendale	City of Glendale	Glendale	2046
28	Skunk Creek	City of Phoenix	Phoenix	2006
29	Salt River	Salt River Pima Maricopa Tribe	Mesa, Scottsdale, Gilbert	2015
NA	Queen Creek	Allied Waste	Queen Creek	2005
30	State Route 85 (planned)	City of Phoenix	Phoenix, Buckeye	2085

In addition to these large regional landfills, there are several smaller landfills operated by the City of Glendale, City of Chandler and City of Phoenix and the Salt River Pima Maricopa Tribe. The City of Phoenix is planning a large new landfill on State Route 85 that will open around 2005. The SR 85 site was approved by the city in January 2002, and is currently going through the ADEQ permitting process. The SR85 landfill will be used both by the City of Phoenix and the Town of Buckeye. There is one more proposed landfill by Southpoint Environmental

Services that is not included in Table 7-1. Southpoint has obtained a special use permit from the county for a proposed landfill in Mobile that could serve customers currently using Butterfield Station or Salt River. However, since they have not yet begun the environmental permitting process or submitted any information to ADEQ, sufficient information was not available to include this landfill in the report.

Each landfill has a capacity in terms of million cubic yards or tons. The specific capacity of each landfill is discussed later in this chapter.

Projected Waste Generation

Population and employment projections are applied to waste generation rates, and then converted from pounds per day to tons per year. For residential waste, generation was assumed to occur 365 days per year, for commercial waste, a factor of 260 days per year was used. The results are shown in Table 7-2. Generally, the amount of waste generation corresponds closely to total population and employment and growth rates by community. *The information shown in Figure 7-2 does not incorporate any assumptions about recycling.*

Recycling

The results of the recycling estimates are shown in Table 7-3. The estimates are shown in tons per day. The “adjusted” recycling rate for communities with curbside programs rises from 27.5 percent in 2003 to 32.8 by 2020, allowing the county as a whole to achieve the target 2000 national recycling level of 30.1 percent. The “adjusted” recycling rate continues to increase beyond 2020 to account for additional waste generated in communities without recycling programs. By 2040, the “adjusted” rate is 35.0 percent, and by build out it is estimated at 37.4 percent.

**FIGURE 7-1
TRANSFER STATION, MRF, AND LANDFILL LOCATIONS
IN MARICOPA COUNTY**

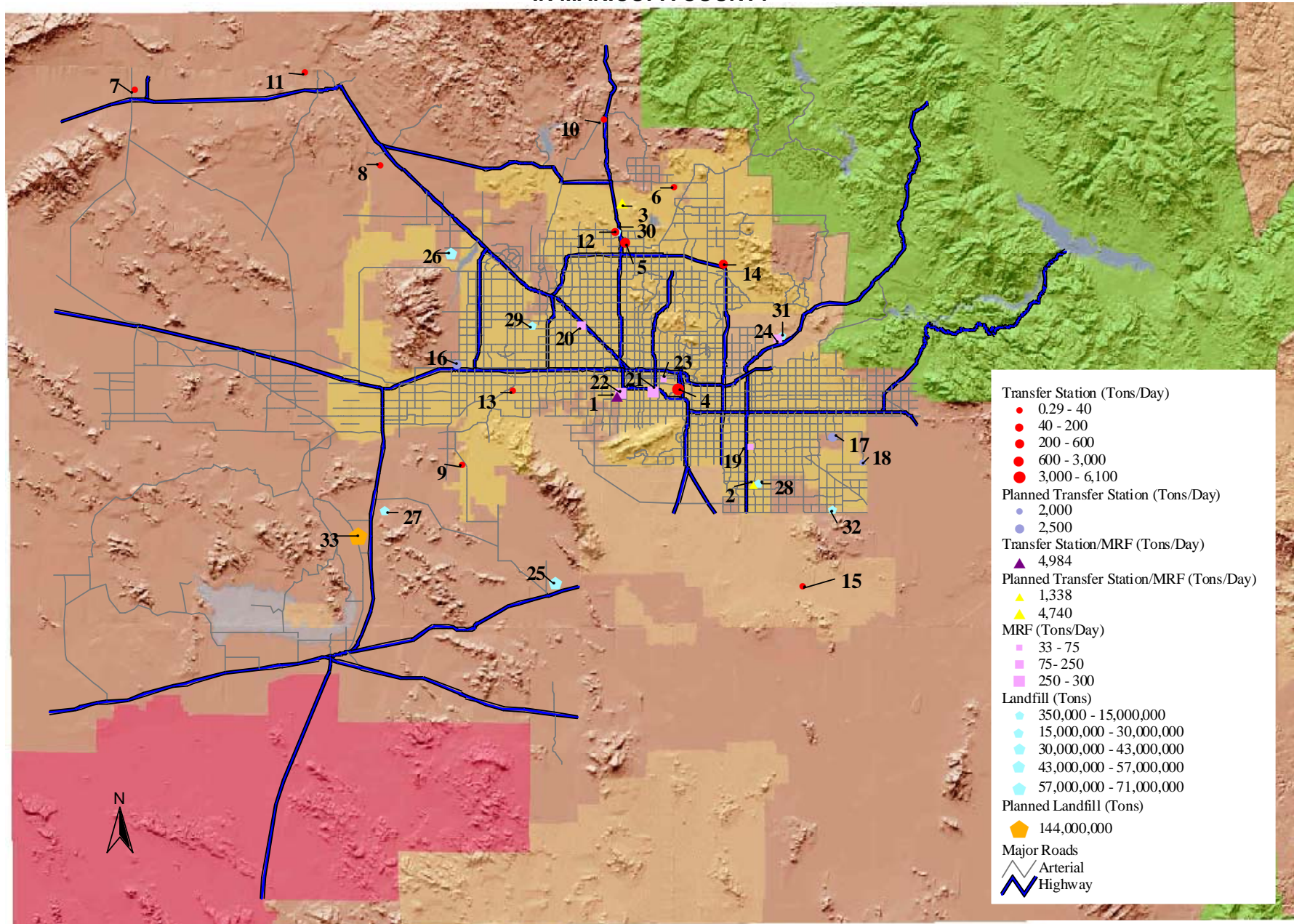


TABLE 7-2
PROJECTED GROSS RESIDENTIAL AND COMMERCIAL WASTE GENERATION
TONS PER YEAR

City	2000	2010	2025	2040	Buildout
Avondale	22,807	47,488	78,046	86,434	93,931
Buckeye	7,921	35,431	155,452	287,393	435,173
Carefree	2,099	3,145	3,822	3,830	3,881
Cave Creek	2,306	3,418	6,015	8,037	8,074
Chandler	111,342	162,291	186,244	192,932	206,589
El Mirage	5,186	20,730	32,567	37,842	40,453
Fountain Hills	12,155	15,734	19,473	19,632	20,044
Gila Bend	1,412	1,859	7,780	40,358	87,288
Gila River	2,754	3,490	5,496	12,368	25,993
Gilbert	80,575	152,785	228,982	242,256	263,674
Glendale	161,363	222,594	262,675	284,274	300,083
Goodyear	16,995	53,420	196,381	287,823	310,175
Guadalupe	2,903	3,307	3,344	3,433	3,469
Litchfield Park	2,401	5,937	9,204	9,363	9,576
Maricopa County	55,695	59,658	96,533	377,244	774,535
Mesa	296,637	370,829	449,484	469,264	481,808
Paradise Valley	13,086	14,037	14,728	14,971	15,083
Peoria	60,947	96,810	196,055	264,997	291,110
Phoenix (N of Cactus)	255,317	352,238	531,241	626,194	658,696
Phoenix (S of Cactus)	706,909	845,543	966,849	1,016,170	1,050,795
Queen Creek	10,681	24,232	107,746	121,231	128,122
Salt River	6,038	6,686	9,405	19,024	22,460
Scottsdale	196,334	228,691	260,670	266,233	272,402
Surprise	15,815	50,321	122,585	284,115	317,369
Tempe	138,121	155,232	171,217	173,904	175,196
Tolleson	6,336	7,971	10,217	13,082	13,828
Wickenburg	6,813	7,335	13,684	31,372	34,279
Youngtown	2,622	4,616	5,418	5,752	5,870
Total	2,203,572	2,955,827	4,151,316	5,199,527	6,049,957

Source: Maricopa Association of Governments Draft 2 Projections, 2002; Applied Economics, 2003; City of Scottsdale; Town of Gilbert.

TABLE 7-3
AMOUNT OF WASTE DIVERTED TO MATERIAL RECOVERY FACILITIES
TONS PER DAY

City	2000	2010	2025	2040	Buildout
Avondale	0	41	78	93	110
Buckeye	0	0	150	296	488
Carefree	0	0	0	0	0
Cave Creek	0	0	0	0	0
Chandler	88	143	189	209	243
El Mirage	0	0	0	0	0
Fountain Hills	0	0	0	0	0
Gila Bend	0	0	0	0	0
Gila River	0	0	0	0	0
Gilbert	64	135	238	269	313
Glendale	103	177	222	238	247
Goodyear	0	45	190	295	346
Guadalupe	0	0	0	0	0
Litchfield Park	0	0	0	0	0
Maricopa County	0	0	0	0	0
Mesa	239	319	445	495	547
Paradise Valley	0	0	0	0	0
Peoria	0	88	209	303	360
Phoenix (N of Cactus)	196	299	520	655	742
Phoenix (S of Cactus)	568	742	976	1,092	1,214
Queen Creek	0	0	0	0	0
Salt River	0	0	0	0	0
Scottsdale	101	158	189	189	189
Surprise	0	42	119	293	356
Tempe	119	147	187	202	217
Tolleson	0	0	0	0	0
Wickenburg	0	0	0	0	0
Youngtown	0	0	0	0	0
Total	1,479	2,336	3,712	4,630	5,371

Source: Maricopa Association of Governments Draft 2 Projections, 2002; Applied Economics, 2003; City of Scottsdale; City of Mesa.

Projected Net Landfill Capacity

Comparing the amount of landfill capacity required annually to the amount of capacity available, it is possible to calculate remaining net capacity in each of the five time periods. Since these calculations must be made on an annual basis, it was necessary to assume a specific year for build out, which in this case is 2050. Table 7-4 shows these remaining capacity figures by landfill.

TABLE 7-4
PROJECTED REMAINING LANDFILL CAPACITY

Facility	Service Area	Remaining Capacity (Tons)			
		2010	2025	2040	2050
Butterfield Station	Gila River, Tempe, Phoenix, Chandler,				
	Cave Creek, Carefree	62,828,632	50,374,675	33,349,533	21,801,005
Northwest Regional	Surprise, El Mirage, Morristown,				
	Aguila, Wickenburg, Deer Valley, Sun City, Peoria	54,027,609	48,763,546	38,322,429	25,459,319
Southwest Regional	Litchfield Park, Buckeye, Gila Bend,				
	Avondale, Goodyear, Tolleson	14,456,400	11,754,224	6,851,333	2,796,359
Chandler	Chandler only	0	0	0	0
Glendale	Glendale	19,667,000	16,459,037	12,862,327	10,308,658
Skunk Creek	Phoenix	0	0	0	0
Salt River	Mesa, Scottsdale, Gilbert	3,351,156	0	0	0
Queen Creek	Queen Creek	288,368	0	0	0
State Route 85 (planned)	Phoenix, Buckeye	146,366,631	128,556,513	107,069,956	91,795,684
County Total		300,985,796	255,907,996	198,455,579	152,161,026

Source: Applied Economics, 2003.

Notes: Assumes 0.6 tons per cubic yard or 1200 lbs per cubic yard

Note that by build out, or 2050, there is a sizeable amount of remaining capacity at Butterfield Station, the Northwest Regional and State Route 85 landfills, and a moderate amount at Glendale. On a regional basis, the 153.44 million tons of remaining capacity at build out would last approximately 30 more years beyond 2050, assuming no more population or employment growth. Of course, these calculations are heavily dependent on the actual level of future recycling and the number of communities with curbside recycling programs.

The Southwest Regional landfill will reach capacity within a year after 2050, based on the assumptions used in this analysis and the current population and employment projections. The Chandler and Skunk Creek landfills will close before 2010, and the Salt River and Queen Creek landfills will close before 2025. For this analysis, the waste from Mesa, Gilbert and Scottsdale that is currently going to Salt River was diverted to Butterfield Station after the Salt River landfill capacity was exhausted, and the waste from Phoenix (south of Cactus) was diverted to the new SR85 landfill after 2010. Similarly, the waste from Buckeye was diverted from the Southwest Regional landfill to the SR85 landfill after 2010. Based on information from Allied Waste, the Town of Queen Creek is likely to divert waste to a landfill in Pinal County once the Queen Creek landfill closes. Thus, Queen Creek waste was excluded from the analysis after the closure of the Queen Creek landfill since this study only includes landfills in Maricopa County. Note that these assumptions are subject to change, but they only affect the balance between landfills, not the net regional capacity. Also, some of these shifts to alternative landfills would require additional transfer stations. For example, when the Salt River landfill closes, additional transfer stations would be required if Mesa, Gilbert and Scottsdale are to use Butterfield Station. Although sufficient capacity may exist in western and southern Maricopa County to absorb the solid waste from Mesa, Scottsdale, Chandler and Gilbert, the cost to these communities of transfer station construction and long haul operations could be considerable. These economic factors may provide a strong incentive for the development of an eastern or southeastern regional landfill, possibly in coordination with Pinal County, as the region moves toward build out.

Conclusions

On a regional level, it appears there is adequate landfill and transfer station capacity to meet the needs of area residents and businesses through build out and beyond, although that capacity is not evenly distributed from a geographic perspective. Additional recycling capacity will likely be required by 2010, although it is much less difficult to construct additional MRFs than to site new landfills.

In terms of landfills, the communities using the Southwest Regional landfill will need to be diverted to another facility between 2030 and 2040. This includes Litchfield Park, Gila Bend, Tolleson, Avondale, Goodyear, Peoria and Fountain Hills. Capacity does exist at other landfills in the area to accommodate the waste generated by these communities. Finally, a new southeast regional landfill may be considered to meet long term needs for communities in the east valley and northern Pinal County.

8. Regional Open Space

This chapter inventories and assesses regional open space. In 1996, the MAG Desert Spaces Plan was completed providing guidance for regional open space planning in the metropolitan Phoenix. Key issues addressed in Desert Spaces: the legal framework for open space planning in Arizona, the implementation of Desert Spaces recommendations, including identification of new parks and preserves, connectivity and coordination of open spaces across the region, for regional open space, and an update of open space preservation tools.

Historically, open space planning in metropolitan Phoenix is conducted both on a regional scale by Maricopa County and MAG, and locally for parks, recreation areas and open space needs within each jurisdiction in the region.

8.1 Regional Open Space Plans

MAG historically has played a role in open space planning for the Region. With the realization that planned and projected development would substantially impact valuable natural resources and open spaces, the Regional Council along with Maricopa County initiated a regional open space planning effort

The Region's leading open space planning effort is Desert Spaces: An Open Space Plan for the MAG Region, adopted by MAG Regional Council in 1996

Overview

Desert Spaces serves to identify land areas believed to be important to the identity and quality of life of the region. The Desert Spaces Plan is based on input and assistance from member agencies, state agencies, individuals and organizations committed to conservation and preservation of natural areas.

The concept for the Desert Spaces Plan is to preserve protect and enhance the mountains and foothills; rivers and washes; canals and cultural sites; upland desert vegetation; wildlife habitat; and existing parks and preserves. The Plan builds on these principal features and envisions an interconnected system of regionally significant scenic, biological, archaeological, and recreational lands. Environmentally sensitive areas of upland Sonoran Desert and flood plains of major rivers and washes that thread through the region are included in the Plan. The Plan also consists of a regional network of trails which primarily follow rivers, washes, and canals and allow the public to traverse the region and enjoy a diversity of open spaces.

Existing parks and preserves in the region (secured open space) are the foundation of the system (Figure 8-1). Proposed trails and future protected areas integrate these existing pieces of open space into a coordinated system.

The Plan establishes policies for conservation of the most important open space resources and for retention of, and access to, critical open space resources that are located in areas that are likely to be developed. Development is considered inappropriate in "Conservation Areas." Development is considered acceptable in "Retention Areas" if it is carried out in a manner that does not degrade the quality of the open space resource and if public access to significant open space resources is maintained.

Management Approaches

The Desert Spaces Plan identifies two basic management approaches for protecting priority areas and resources. The approaches address various levels of protection and include private and public lands that are not in danger of development as well as public and private lands that could be developed in the near and long term future. These are shown in Figure 8-1.

Conservation: Conservation Areas are public and private lands with outstanding open space value. These areas are recommended for protection from development and its effects through policy amendment, easements, restrictions, and/or acquisition. Land in this category is to be managed to protect, maintain and enhance the intrinsic value of such lands for recreational, aesthetic and biological purposes. Public access to these lands should also be ensured. Development should be discouraged.

Retention: Land in this category is intended to be planned and managed to allow development if it is sensitive and does not degrade the quality of the open space resources and values. Sensitive development is defined as any land use change that takes place while maintaining the character of the desert landscape and the natural and cultural resources that define that character. Retention Areas are public and private lands with high open space value. These areas are recommended for sensitive development regulation.

Secured Open Space: Designated parks, wilderness, and wildlife areas; these lands are not normally considered for development and are currently secured as open space in perpetuity.

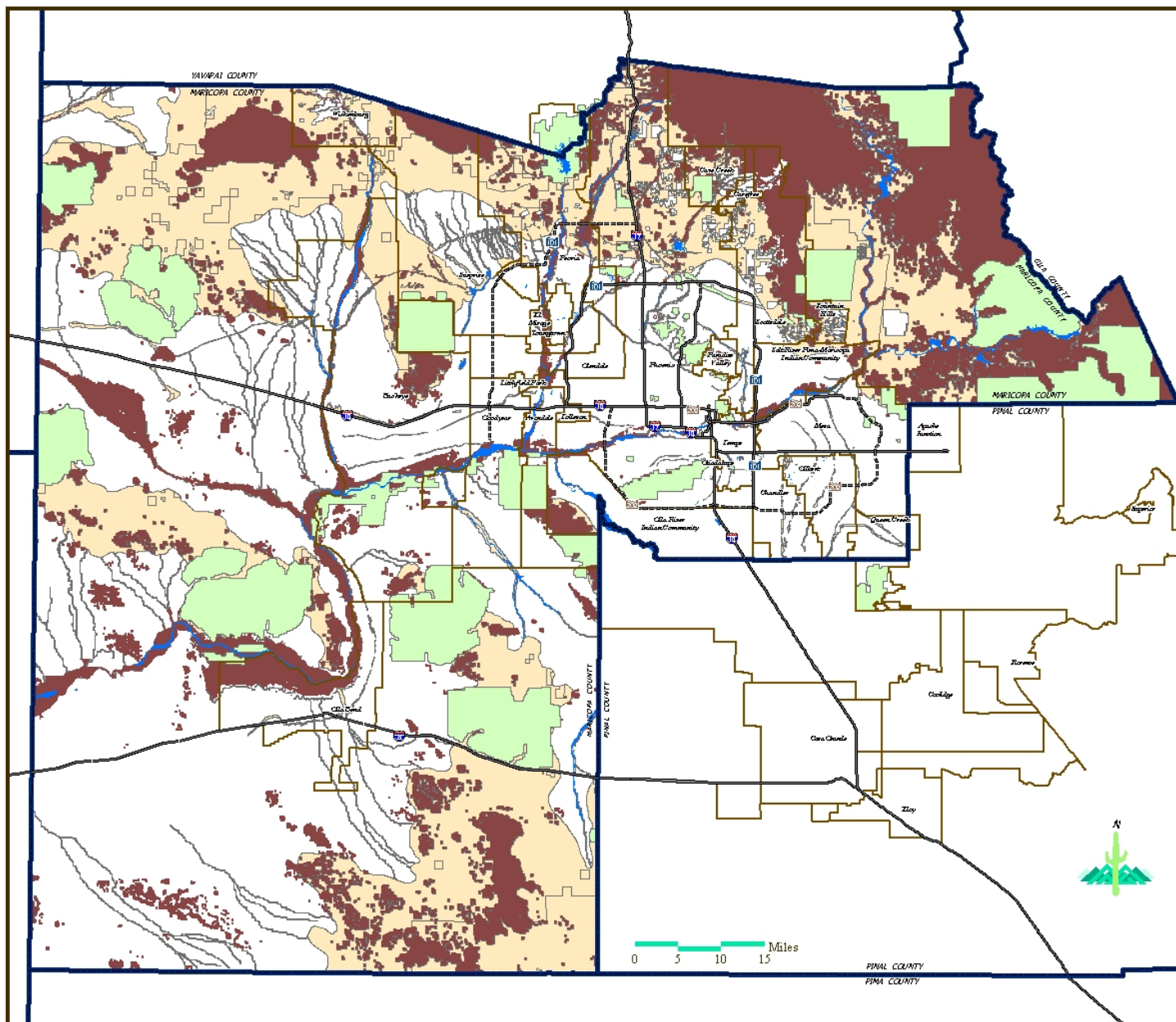
8.2 Regional Connectivity

Regional Off-Street System (ROSS)

The adopted regional open space plan, Desert Spaces, stresses the importance of interconnected open space across the region. The Regional Off-Street System (ROSS) Plan, prepared by MAG, identifies a region-wide system of off-street paths/trails for non-motorized transportation.

Throughout the MAG region, numerous opportunities for off-street travel by people who walk and bike exist along areas such as canal banks, utility line easements and flood control channels. These types of rights-of-way and easements intersect many arterial streets where local daily destinations are typically located. The goal of the ROSS plan is to help make bicycling and walking viable options for daily travel trips using off-street opportunities.

The ROSS plan provides guidance to MAG member agencies in creating an off-street, non-motorized transportation system. The Plan focuses on potential corridors that form the backbone of a regional off-street system of routes. The ROSS plan identifies issues associated with paths/trails and non-motorized transportation, identifies potential corridors for paths/trails in the MAG region and provides design guidelines for paths/trails.



MAG DESERT SPACES PLAN MANAGEMENT APPROACHES

FIGURE 8-1

Legend

- Conservation Areas
- Retention Areas
- Secured Open Space
- County Boundary
- Municipal Planning Area
- Water
- Freeways
 - Existing
 - Planned

Map prepared by Maricopa Association of Governments
May, 2003

Sources: MAG Desert Spaces Plan, 1995

While every effort has been made to ensure the accuracy of this information, the Maricopa Association of Governments makes no warranty, expressed or implied, as to its accuracy and expressly disclaims liability for the accuracy thereof.

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Maricopa County Regional Trail System

The vision of the regional trail system is to connect regional parks with a non-motorized trail network, suitable for users of all ages and types. The goal of the regional trail program is to connect the regional park system, link recreational corridors around the Valley, and help preserve open space in the community.

The Phase I or pilot study for the program identified 221 miles of recommended trail alignments linking White Tank Mountain Regional Park, Lake Pleasant Regional Park, Spur Cross Ranch Conservation Area and Cave Creek Recreation Area. The system will capitalize on existing rights-of-way such as canals, parks, utility corridors, and flood control projects. As part of the ongoing program, the Maricopa County Trail Commission is developing partnerships with communities to help implement the trail system.

8.3 Agency Roles

Multiple Federal, State and private non-profit agencies play a substantial role in open space resource management in the region. This section discusses the program coordination and specific responsibilities and activities.

Federal Land Ownership and Management

Bureau of Land Management

The Bureau of Land Management (BLM) – Arizona manages over 967,000 acres of public lands in two planning areas in the MAG region: the Bradshaw Harquahala and the Phoenix South Planning Areas. The BLM manages public lands for multiple uses: recreation, grazing, and mining.

Role in Land Inventory and Development

The sale and exchange of BLM lands is authorized by the 1976 Federal Land Policy and Management Act. Since 1996, BLM has been involved in two land exchanges in the MAG region: 4,300 acres in northwest Peoria disposed to private interests, and 616 acre open space exchange between the Tonto National Forest, BLM, Ft. McDowell Mohave-Apache Community and Fountain Hills. Buckeye currently has an application to obtain 8,900 acres of BLM land as an addition to White Tanks Regional Park.

Cooperative Efforts

BLM is working with the Arizona State Land Department, Arizona Department of Transportation, Arizona Game and Fish Department, Maricopa County, City of Phoenix, City of Peoria, and the Town of Wickenburg to establish cooperating agency status agreements that facilitate formal cooperation and participation in the BLM's planning process. BLM also has initiated consultation on land management with MAG area tribes: the Fort McDowell Yavapai Nation, the Gila River Community, and the Salt River Pima-Maricopa Indian Community.

United States Forest Service

The United States Forest Service (USFS) manages the Tonto National Forest for multiple use and long-term public benefits. The USFS has authority, when in the public interest, to exchange lands with non-federal parties within the boundaries of National Forests within a state.

The only exchange for open space protection in the MAG region since the adoption of Desert Spaces in 1996 included the 616 acre exchange between the Fort McDowell Mohave-Apache Indian Community, the BLM, Fountain Hills and the Tonto National Forest.

State Agencies

Arizona State Land Department

The Arizona State Land Department (ASLD) is the largest, non-federal landholder in the region. The Department's mission is to enhance the value of trust lands through assuring the highest and best use.

Arizona Preserve Initiative

Initially passed in 1996 and subsequently amended, the API is designed to encourage the preservation of select parcels of State Trust Land in and around urban areas for open space. API establishes a process by which Trust Land can be leased for up to 50 years or purchased at auction for conservation purposes.

State Parks Department

The Arizona State Parks Department manages no parks, preserves or other lands in Maricopa County. However, the Department administers grant monies for securing open space in the MAG region.

Table 8-1 outlines grant awards for regional open space projects initiated since 1996.

Table 8-1
Grant Awards for Regionally Significant
Open Space Projects¹

Project	Size (acres)	Manager	Grant Program	Description
Queen Creek Wash	19	Queen Creek	LRSP	Acquisition adjacent to Queen Creek Wash for park and regional trail access
Goat Camp Trail Extension	11	Maricopa County	Trails	Acquisition of land and new regional trail head.
Sonoran Preserve	2,034	Phoenix	GSLA	Acquisition of State Trust Land
Go John Canyon	241	Desert Foothills Land Trust	GSLA	Acquisition of State Trust Land
Jewel of the Creek	26	Desert Foothills Land Trust	GSLA	Acquisition including a portion of Cave Creek adjacent to Spur Cross Road
Sanokal Wash Trail and Park	55	Queen Creek	LRSP	Acquisition of trail corridor, park and equestrian area

¹ Arizona State Parks Department, Partnership Division, April 30, 2003

Maricopa County Flood Control District

Regionally significant projects such as Indian Bend Wash, Tempe Town Lake and a host of others that include Freestone Park, Kiwanis Park, Old Cross Cut Canal, and Falcon Dunes Golf Course, amply demonstrate how flood control facilities can create aesthetic value, contribute a unique sense of identity and place to local communities, and provide a wide variety of open space opportunities and benefits for local citizens throughout the year.

Land Trusts and Non-Profits

A number of land conservation trusts and non-profit organizations combine to play a significant role in regional open space protection and acquisition.

Organizations most active in the MAG region include the Trust for Public Land (TPL), the Desert Foothills Land Trust, McDowell Park Association, White Tanks Concerned Citizens, and the Wickenburg Cultural and Conservation Foundation. Table 8-2 summarizes pending protection and acquisition activities for local non-profits specifically related to regional open space protection.

**Table 8-2
Non-Profit Agency
Regional Open Space Protection Efforts**

Organization	Size (Acres)	Jurisdiction	Status
Desert Foothills Land Trust	267	Cave Creek	Sale completed
McDowell Park Association	1,312	Fountain Hills	Reclassified to conservation, no sale/lease application filed
White Tanks Concerned Citizens	22,963	Buckeye	Pending
Wickenburg Cultural and Conservation Foundation	1,045	Wickenburg	429 ac. reclassified; 616 ac. denied.

8.4 Local Role in Regional Open Space Planning

While regional open space serves entire metropolitan areas, the planning and implementation for open space is generally left to the individual jurisdictions that comprise the region. In metropolitan Phoenix, this is particularly true where local jurisdictions take primary responsibility for planning and securing open space. All Maricopa County jurisdictions are engaged in open space planning.

Summary of Local Planning for Regional Open Space

Open Space planning is addressed at two basic, local levels: General or Comprehensive Plan Open Space and Land Use Elements and more specific Parks and Recreation Master Plans.

Regional open space facilities or sites are large by nature 200-1000 acres². It is not reasonable to expect each jurisdiction to provide regional facilities. It is important to look at region as a whole in assessing open space level of service and needs.

Table 8-3 summarizes local open space planning efforts including open space element status, the existence of Master Plans specific to open space, parks or recreation and a notation of regional connectivity and trail links.

²Park, Recreation, Open Space and Greenway Guidelines, National Recreation and Park Association, 1996

**Table 8-3
Status of Local Open Space Planning**

JURISDICTION	General Plan Open Space Element	Master Plans	Regional Trail Connections*
Apache Junction	2000		Usery Mt. Park, Superstition WA
Avondale	Draft	Parks, Recreation and Open Space , 2001, El Rio	West Valley Rec. Corridor, Agua Fria
Buckeye	1999	Outdoor Recreation Master Plan 1998	Gila River, White Tank Park
Carefree	2000		Tonto NF
Cave Creek	2000		Cave Creek, Cave Creek Rec Area, Tonto NF
Chandler	2001	PR Master Plan Update 2000	Sun Circle Trail
El Mirage	Draft	Open Space and Recreation 1987	Agua Fria River
Fountain Hills	2002		McDowell Mt. Park
Gila Bend	1997		Gila River
Gila River Indian Community			
Gilbert	2001		Canals, RR, Queen Creek, Sanokai Wash
Glendale	2002	PRMP 2002	Skunk Creek, Agua Fria, AZ Canal
Goodyear	Draft	2001, El Rio	Bullard Wash, Gila River, Agua Fria
Guadalupe	1997	Open Space Master Plan, 1997	Sun Circle Trail
Litchfield Park	2001		None
Maricopa County	2001	Maricopa County Regional Trails Plan	Trails linking all County Regional Parks
Mesa	2002	PRMP 2002	Usery Mt. Park, canals
Paradise Valley	2001		Phoenix Mt. Preserves
Peoria	2001	PRMP 2002	Agua Fria, New Rivers, canals
Phoenix	2001	2001	Multiple trail, canal and park links
Queen Creek	2002	Draft	Queen Creek, San Tans
SR Pima-Maricopa Indian Community	1988		Salt River, CAP and AZ canals
Scottsdale	2000	Trails Master Plan	McDowell Mt. Park, multiple
Surprise	2002		McMicken Dam, White Tank Park
Tempe	Draft	PRMP 2001	Rio Salado, Indian Bend, Cross Cut Canal
Tolleson	Draft		None
Wickenburg	Draft		Hassayampa River
Youngtown	Draft		Agua Fria River

*Existing or planned trail segments or connections as represented on local open space plans.

8.5 Existing Regional Open Space

Figure 8-2 illustrates regional open spaces including regional parks, recreation areas and preserves. Table 8-4 lists major regional open space including regional parks, recreation areas, and mountain preserves, their sizes and the managing agency. These regional facilities all lie within the MAG region.

**Table 8-4
Regional Open Spaces**

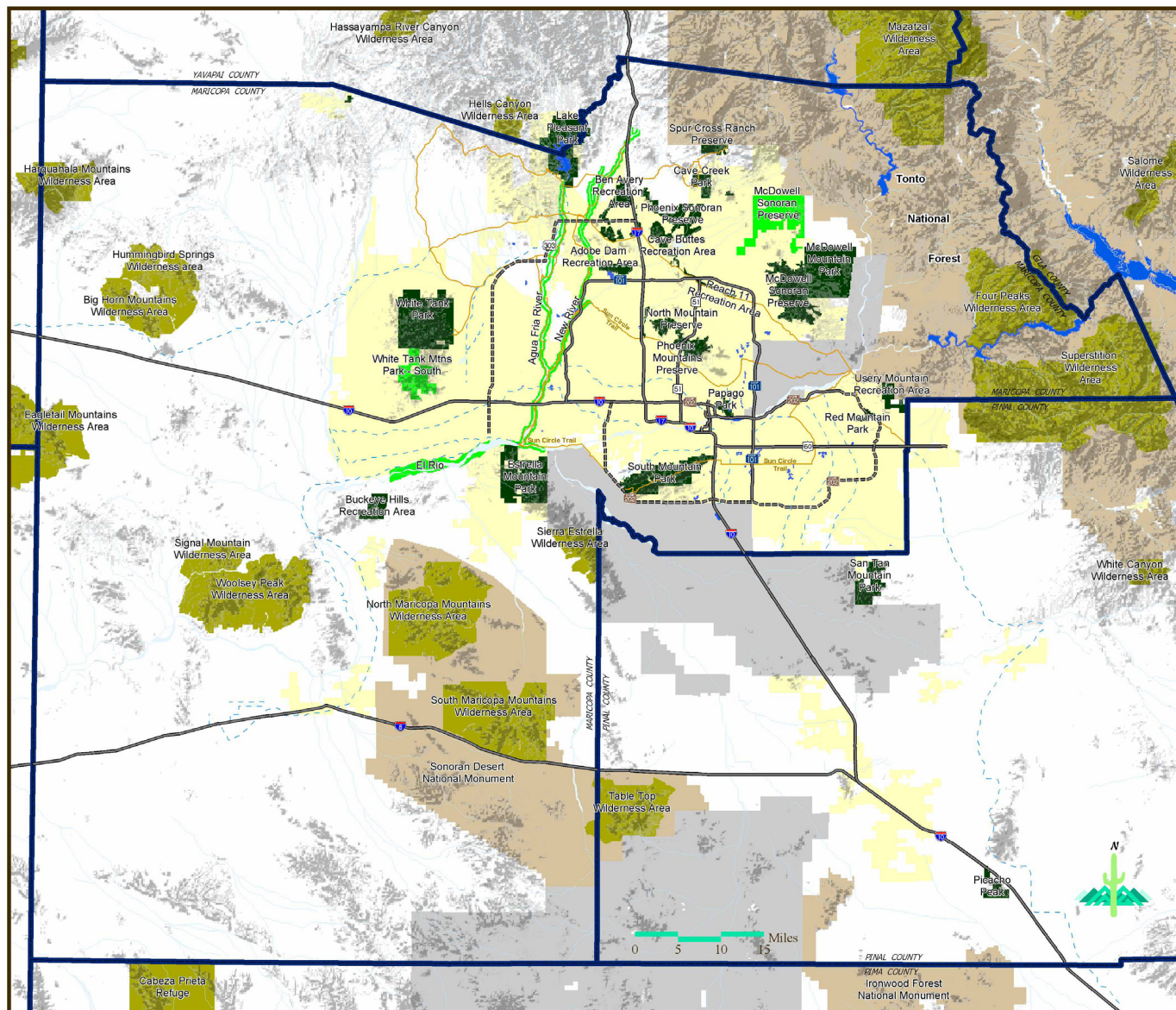
Area	Acres	Management
White Tank Mountain Regional Park	26,337	Maricopa County
Lake Pleasant Regional Park	23,662	Maricopa County
McDowell Mountain Regional Park	21,416	Maricopa County
Estrella Mountain Regional Park	19,840	Maricopa County
San Tan Mountains Regional Park	10,118	Maricopa County
Buckeye Hills Park	4,474	Maricopa County
Usery Mountain Recreation Area	3,648	Maricopa County
Cave Creek Recreation Area	2,740	Maricopa County
South Mountain Park	16,500	City of Phoenix
Phoenix Mountain Preserve	5,436	City of Phoenix
Cave Buttes Recreation Area	2,200	City of Phoenix
Reach 11 Recreation Area	1,673	City of Phoenix
North Mountain Preserve	1,672	City of Phoenix
Papago Park	1,200	Phoenix and Tempe
McDowell Sonoran Preserve	10,865	City of Scottsdale
Red Mountain Park	1,146	City of Mesa
Ben Avery Shooting Range	1,650	AZ Game & Fish Dept.
Adobe Dam Recreation Area	<u>1,526</u>	Various private entities
Total	156,103	

Substantially enhancing the region's open space assets are a series of wilderness areas, the Sonoran Desert National Monument and the Tonto National Forests. These areas add over 1.4 million acres to the region's inventory of preserves and provide important open space and recreational opportunities to region residents and visitors. Table 8-2 lists these additional open spaces and their approximate sizes.

Table 8-5
Wilderness Areas and Other Existing Region Serving Preserves

Wilderness Areas and Other Significant Regional Open Spaces	Acres
Sonoran Desert National Monument	496,000
Eagle Tail Mountains Wilderness Area	97,880**
Woolsey Peak Wilderness Area	64,000
North Maricopa Mountains Wilderness Area	63,200
South Maricopa Mountains Wilderness Area	60,100
Fred J. Weiler Greenbelt	62,735
Hummingbird Springs Wilderness Area	31,200
Harquahala Mountain Wilderness Area	22,880**
Big Horn Mountains Wilderness Area	21,000
Sierra Estrella Wilderness Area	14,400
Signal Mountain Wilderness Area	13,350
Hell's Canyon Wilderness Area	9,311**
Tonto National Forest (includes Mazatzal, Four Peaks, and Superstition Wilderness Areas)	657,700
Total	1,483,685

**Total acreage includes areas that extend outside Maricopa County



REGIONAL OPEN SPACES

Legend

- Regional Park/Preserve/Recreation Area
- Planned Open Space Area
- National Forest/National Monument
- Wilderness Area
- Trail Alignments
- Incorporated Area
- Indian Community
- County Boundary
- Water**
- Lake/River
- Intermittent Water
- Stream/Wash
- Canal
- Freeways**
- Existing
- Planned

Section 8-2

Map prepared by Maricopa Association of Governments
June, 2003

While every effort has been made to ensure the accuracy of this information, the Maricopa Association of Governments makes no warranty, expressed or implied, as to its accuracy and expressly disclaims liability for the accuracy thereof.

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8.6 Regional Open Space Assessment

Analysis of Desert Spaces Conservation Areas (DSCA) and newly secured open space highlights positive steps taken in the metropolitan area to secure lands deemed to have the greatest value for open space. Since the adoption of Desert Spaces in 1995, a total of 59,270 acres of Conservation Area have been secured, substantially enhancing the region's inventory. Newly secured Desert Spaces Conservation Areas are detailed in Table 8-3.

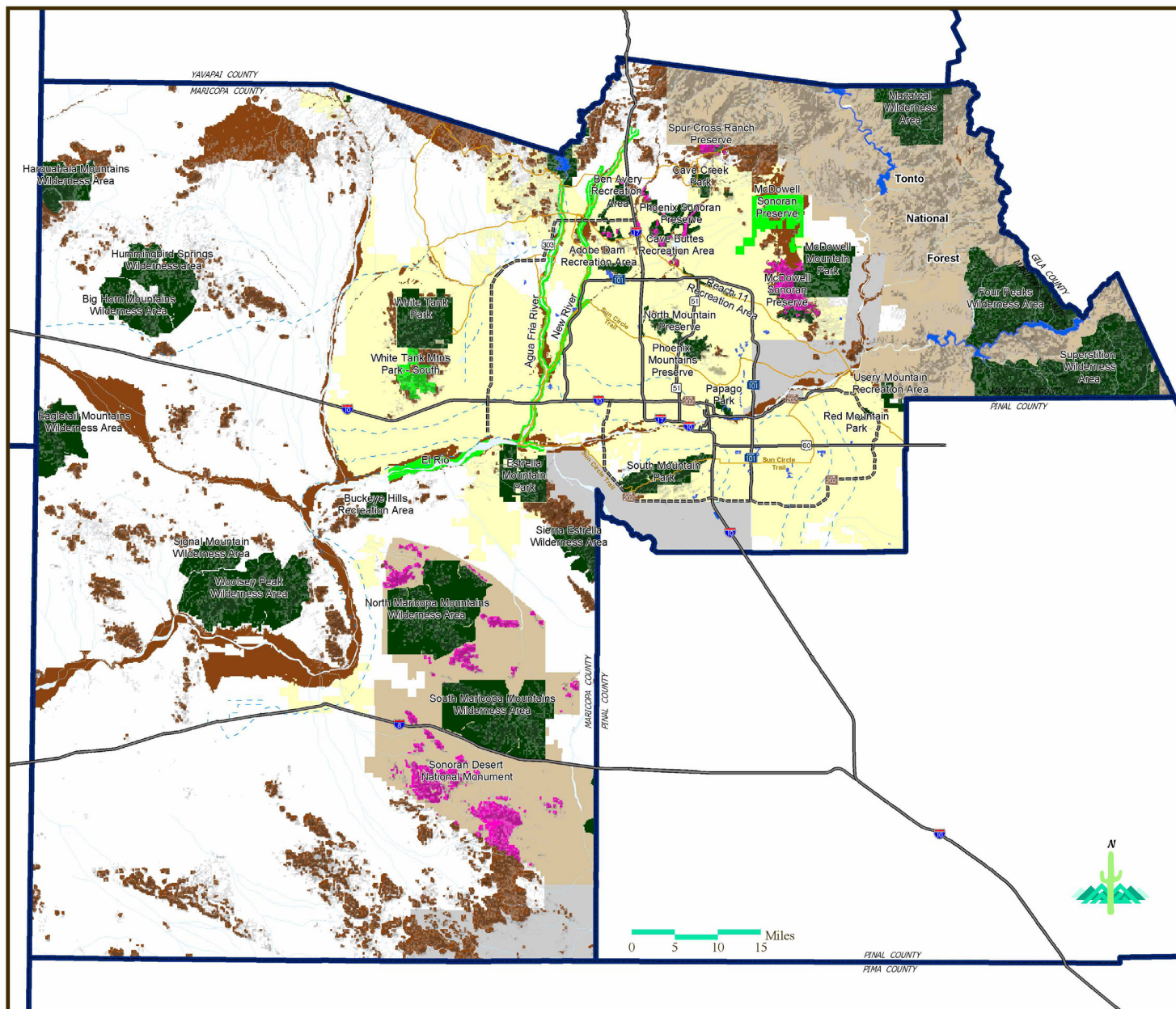
Table 8-6
Newly Secured Desert Spaces Conservation Areas

Area	Acres	Managing Agency
Sonoran Desert National Monument	44,090	BLM
Phoenix Sonoran Preserve	3,690	City of Phoenix
McDowell Sonoran Preserve	10,100	City of Scottsdale
Spur Cross Ranch Preserve	1,390	Maricopa County
Total	59,270	

Figure 8-6 highlights Desert Spaces Conservation Areas secured since 1995. Remaining DSCA's that are not yet protected from development are shown as "Unsecured Conservation Areas". Unsecured DSCA's include those lands outside the National Forest, Wilderness Areas or National Monuments with high conservation values.¹ These unsecured areas, particularly those nearest the urbanizing area, should have the highest priority for future acquisition or protection.

Additionally shown in Figure 8-3 are "Planned" open space areas which include lands individual jurisdictions are in the process of securing ownership or control of use. These areas include McDowell Sonoran Preserve (second Phase), Agua Fria and New River corridors, and White Tanks Mountain Park South. Upon completion, these preserves will further enhance the metropolitan area's secured open space inventory.

¹ Conservation Areas located within the boundaries of Forests, Wilderness Areas or National Monuments are considered secured. MAG recognizes that land within National Forests can be traded and hence become available for development. Since such action is rare and contrary to local and regional policy, such likelihood is considered minimal.



PLANNED AND SECURED OPEN SPACE AND CONSERVATION AREA

FIGURE 8-3

Legend

- Desert Spaces Conservation Areas Secured Since 1995
 - Planned Open Space Area
 - Secured Open Space in 1995
 - National Forest/National Monument
 - Unsecured Conservation Areas
 - Trail Alignments
 - Incorporated Area
 - Indian Community
 - County Boundary
- Water**
- Lake/River
 - Intermittent Water
 - Stream/Wash
 - Canal
- Freeways**
- Existing
 - Planned

Map prepared by Maricopa Association of Governments
June, 2003

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Conclusions

Secured open space in the MAG region is a valued part of the quality of life of region residents. The inventory of regional open space in metropolitan Phoenix is extensive and diverse:

- Regional Parks
- Recreation Areas
- Mountain and Desert Preserves
- Wilderness Areas
- National Forest

Historically, residents of the region have supported open space planning and acquisition. Phoenix's successful Parks and Preserves Initiative provided a clear indication of public support, including the will to pay for open space protection. Additionally, the findings of a 1997 survey² of over 800 voters in Maricopa County revealed important public opinions regarding open space:

- The Desert Spaces Plan is supported by a large majority of voters.
- The Plan is popular in all areas of the County.
- Support for funding the plan is "robust".
- Protecting unique topography, scenery, flora and fauna are seen as the most compelling reasons to support the plan.
- Sales taxes and Bonds are the preferred way to pay for the Plan.

The metropolitan Phoenix enjoys a healthy inventory of regional open spaces, an accepted plan to protect the most valuable areas and an informed public that supports open space protection and has the will to pay for it.

The challenges for the MAG region center on:

- **Coordination between member agencies.** Regional open space by its nature must be planned and implemented on a *regional* basis. Continuity and interconnection of adjacent open space areas, particularly linear features such as rivers, washes and canals, are key strategies in implementing Desert Spaces. Potential for connectivity should be evaluated in General Plans and Recreation Master Plans.
- **Coordination with land management agencies including BLM, National Forest Service and the Arizona State Land Department.** Monitoring and participating in the planning and land exchange processes will help assure public land management meets regional open space goals. Participation in the ongoing Resource Management Plan (RMP) preparation process for both BLM planning areas in the metropolitan Phoenix can assure coordination with regional open space goals. Similar to BLM managed lands, Forest Service land exchanges within the Tonto National Forest have the potential to play an important role in open space protection and acquisition in the metro area.
- **Monitor State Land Reform.** As the largest single land holder in the region, disposition and ultimate use of State Land will significantly impact residents of the

² MAG sponsored survey conducted by the Mellman Group of Washington D.C.; Survey, November 1997, margin of error $\pm 3.5\%$.

region. Reforms in the State Constitution, management and disposition of State properties represent a major opportunity to positively affect open space planning and implementation in the MAG region and across the State.

- **Continued Implementation of Desert Spaces.** Specific recommendations exist to further implement Desert Spaces. The Desert Spaces Implementation Task Force Final Report provides itemized recommendations each MAG member agency can consider in creating local policy. Distribution and application of the ESDA document can help assure compatibility between future development and sensitive conservation areas.
- **Identify Resources at Risk and Establish Acquisition Priorities.** One method of identifying resources at risk is to compare Desert Spaces identified conservation areas to planned land uses. Local jurisdictions have the opportunity to evaluate land use proposals for identified conservation areas and establish appropriate local policy.

9. School Facilities

Two reports were completed to assess school facilities in the region. Historic enrollment, school district and facility trends are first reviewed. Following are future enrollment and facility demands based on socio-economic projections and adopted General Plan land uses.

Four types of educational providers serve the school-age population of Maricopa County: traditional school districts, charter schools, private/parochial schools and institutions. Traditional districts serve the vast majority of student population, about 83 percent, and as such are the primary focus of this study. Charter schools, schools that are publicly funded but may be privately administered, educate approximately 12 percent of Maricopa County's publicly funded students. Private and parochial schools, and institutions such as detention centers serve the remaining 5 percent of the school-age population.

There are three different types of public school districts in Maricopa County. A brief description of the nature and history of the types provides the context for understanding the various geographic and demographic characteristics of Maricopa County school districts. As the Phoenix area grew in the early 20th century, attendance boundaries were drawn to create school districts that allowed for the efficient distribution of schools among the school-age population. In that era, compulsory education only served up to 8th grade. Those original district boundaries have not changed, and they are now known as elementary districts and serve grades kindergarten through eight. These older districts are noticeably smaller in area since people did not travel great distances on a daily basis. The elementary districts are primarily located in the older areas of Phoenix, Tempe, and areas along the Salt River.

Currently, there are 14 unified districts, six union high school districts, 28 elementary districts within high school districts and seven elementary districts that do not belong to a union high school district (Figures 9-1 and 9-2). There is also an accommodation district that serves areas outside of incorporated school districts. Union districts in Figure 9-1 are highlighted in green. Figure 9-2 shows the 28 elementary school districts located within the six union districts. Areas in white are unorganized areas that may encompass national forests, military installations, American Indian communities, or age-restricted areas, such as Sun City. Note that although the J.O. Combs and Apache Junction districts are included in this map, the enrollment in these districts is not incorporated in this study because these districts are mainly in Pinal County.

Table 9-1 shows public enrollment by grade for the entire county in 1995 and 2000. Note that this table includes both district and charter school enrollment. From 1995 to 2000, enrollment increased for all grades, however, the amount of the growth varied significantly by grade level. Grades two, four and eight experienced the largest percentage increases, while tenth, twelfth and first grades had the smallest rate of growth. These trends may have been caused by a variety of factors. There is a fair amount of natural fluctuation in population growth in Maricopa County, as families tend to migrate to and from the area while their children are relatively young. Secondly, the dropout factor tends to have inverse impact on enrollment at the higher grades. Finally, rates of growth may also be affected inversely by charter and alternative school options, since each may target separate grade levels.

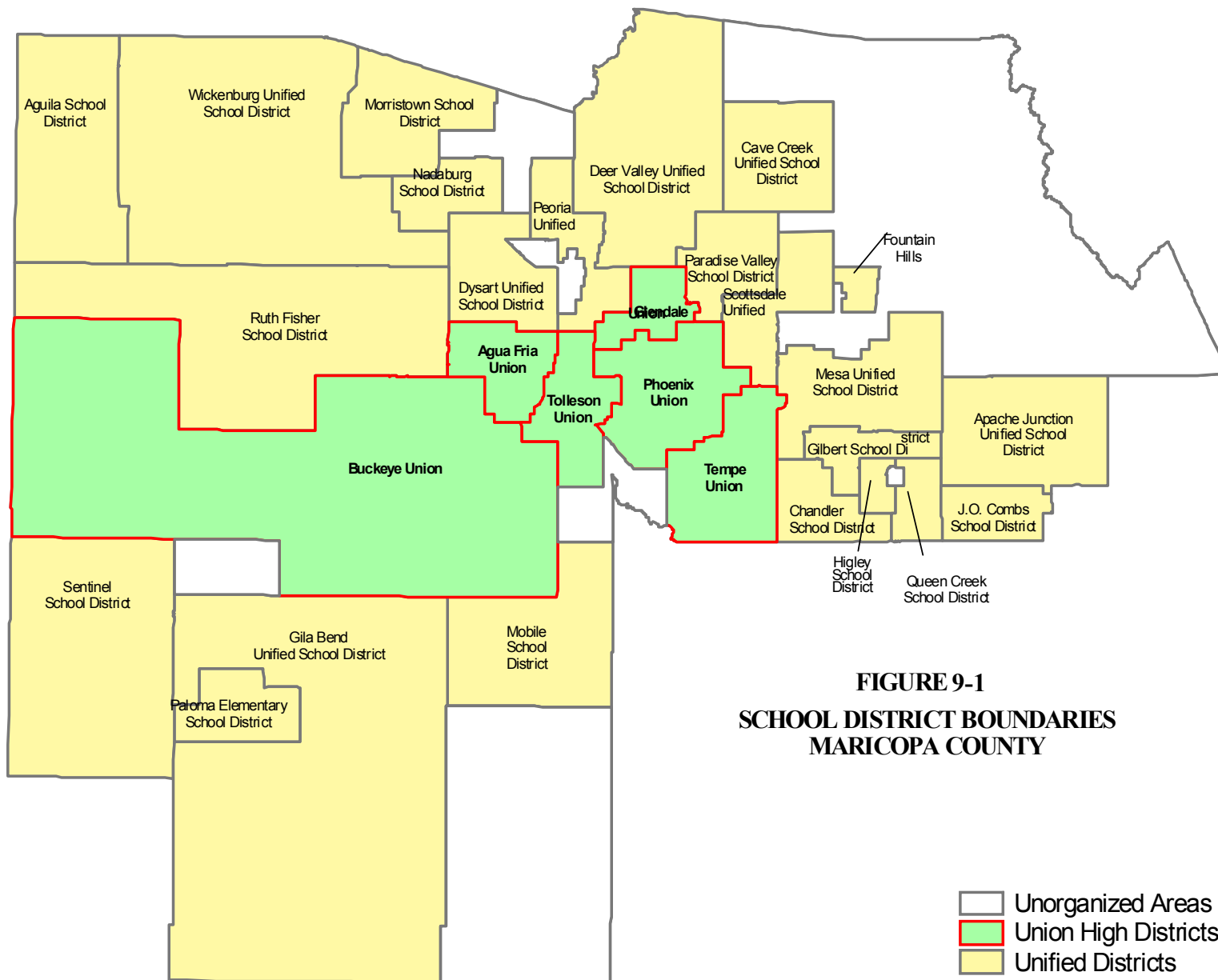
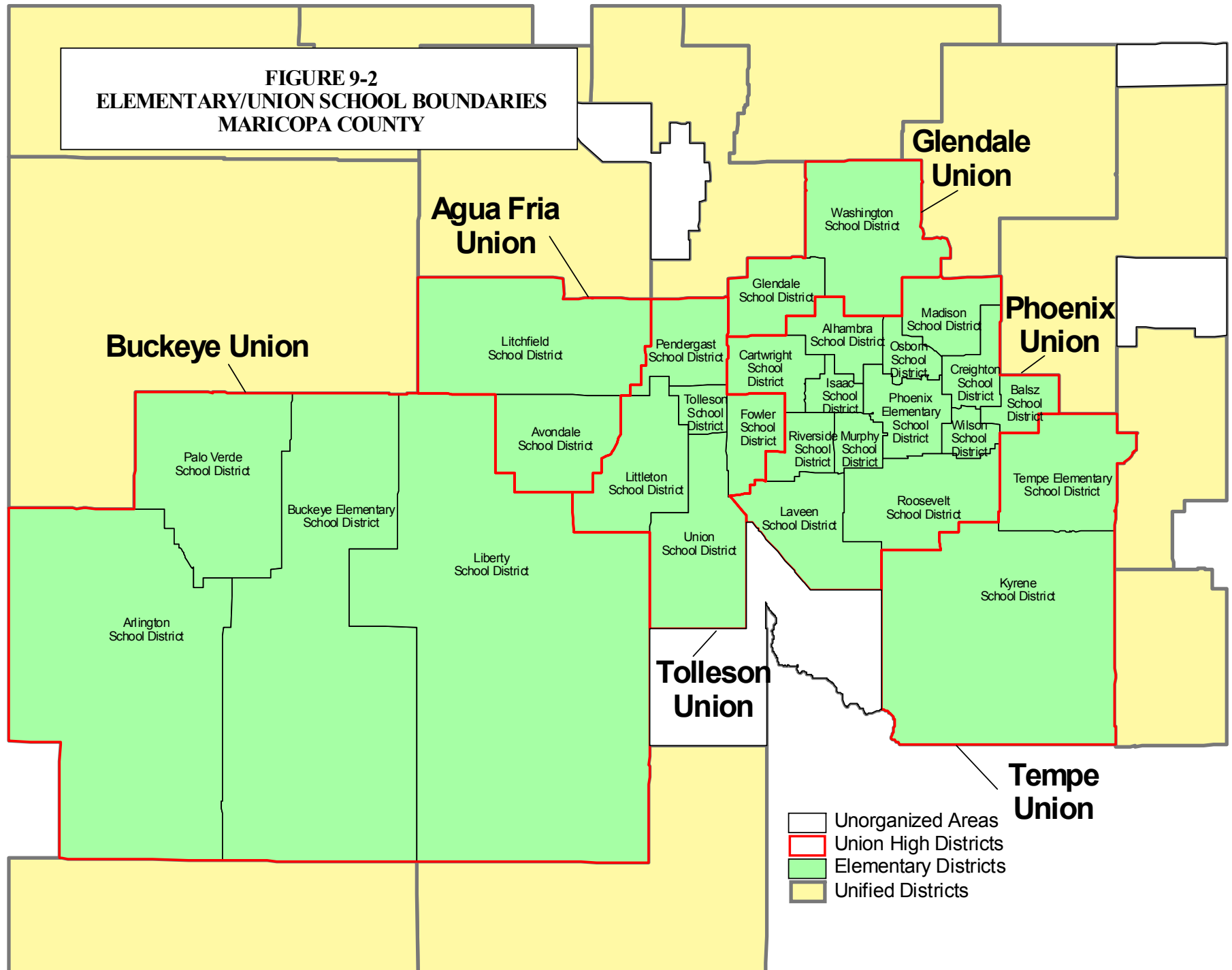


FIGURE 9-1
SCHOOL DISTRICT BOUNDARIES
MARICOPA COUNTY

- Unorganized Areas
- Union High Districts
- Unified Districts

**FIGURE 9-2
ELEMENTARY/UNION SCHOOL BOUNDARIES
MARICOPA COUNTY**



**TABLE 9-1
PUBLIC SCHOOL ENROLLMENT BY GRADE
MARICOPA COUNTY**

Grade	1995			2000			1995-2000 Change	
	Male	Female	Total	Male	Female	Total	Absolute	Percent
Preschool	1,204	606	1,810	2,093	1,195	3,288	1,478	81.7%
Kindergarden	18,165	16,785	34,950	21,868	20,601	42,469	7,519	21.5%
First	18,992	17,773	36,765	22,976	21,512	44,488	7,723	21.0%
Second	17,854	17,049	34,903	22,433	21,345	43,778	8,875	25.4%
Third	17,954	16,956	34,910	22,588	21,030	43,618	8,708	24.9%
Fourth	17,687	16,728	34,415	22,024	21,353	43,377	8,962	26.0%
Fifth	16,885	16,256	33,141	21,112	20,197	41,309	8,168	24.6%
Sixth	16,978	16,284	33,262	20,644	19,675	40,319	7,057	21.2%
Seventh	16,785	15,993	32,778	20,168	19,350	39,518	6,740	20.6%
Eighth	15,768	15,053	30,821	19,928	18,991	38,919	8,098	26.3%
Ninth	16,180	15,372	31,552	19,933	18,807	38,740	7,188	22.8%
Tenth	15,015	14,166	29,181	17,822	16,886	34,708	5,527	18.9%
Eleventh	12,716	12,141	24,857	15,556	15,094	30,650	5,793	23.3%
Twelfth	11,751	11,547	23,298	14,246	14,032	28,278	4,980	21.4%
Ungraded Elementary	1,551	871	2,422	1,254	639	1,893	-529	-21.8%
Ungraded Secondary	362	49	411	1,977	1,221	3,198	2,787	678.1%
Total	215,847	203,629	419,476	266,622	251,928	518,550	99,074	23.6%

Sources: Arizona Department of Education, School Finance Unit, 2001; Applied Economics, 2001.

A great deal of change in the education system in Arizona occurred between 1995 and 2000. The establishment of charter schools in 1995 and their subsequent proliferation changed the composition of publicly funded education. In 1995, district enrollment accounted for 99.5 percent of all publicly funded students and by 2000 that share dropped to about 95 with charter schools educating about 4.5 percent of students

The unified districts experienced significant absolute enrollment growth of more than 50,000 students between 1995 and 2000. Elementary districts that are not in a high school district, which are generally rural, experienced very small enrollment growth compared to elementary districts that are within high school districts. It is interesting to compare growth rates in the elementary districts to growth in their corresponding high school districts. Enrollment in the former grew over 23,000 or 15.2 percent, while union high school enrollment grew by less than 3,000 students, or 5.0 percent. This difference in growth patterns is likely the result of a combination of several demographic, sociological, and educational factors. Perhaps the large increase in the elementary student population will translate into large future increases in the union high school population.

9.1 Capital Funding

The School Facilities Board (SFB) oversees the capital funding for all districts to ensure uniform facilities are available, regardless of the wealth and property tax contributions of each district. The Board was created in 1998 as the result of a court decision declaring the previous school funding system unconstitutional.

The Students FIRST (Fair and Immediate Resources for Students Today) legislation was signed into law in July 1998, paving the way for the correction of deficiencies in existing schools, building renewal and new school construction. The programs are financed by state sales tax and provide schools with basic capital infrastructure according to adequacy guidelines. The concept of Students FIRST is fundamental, because it relieves the burden on individual districts to generate local funding through bond elections, general property tax and overrides in order to finance capital structures for education. Through this legislation, state sales tax is distributed on an equal basis to wealthy and poor districts alike throughout the state based on facility needs.

The School Facilities Board provides financing for the construction of new facilities employing guidelines and standards. The most important factors in the capital funding equation are projected enrollment and minimum required square feet per pupil. The standards vary depending on the location, size and grade level of the schools in each district and account for higher construction costs in rural areas (Table 9-2).

Projected enrollment is also a key factor for determining new school funding. Each individual district must provide ten-year enrollment projections to the SFB as a basis for current and future funding.

**TABLE 9-2
CAPITAL FACILITIES FUNDING STANDARDS
STATE OF ARIZONA**

Grade Level	Square Feet per Pupil	Cost per	Cost per
		Square Foot Urban	Square Foot Rural
K-6	90	\$97.43	\$102.30
K-8	92.4	\$98.71	\$103.65
6-8	97	\$101.04	\$106.09
7-8	100	\$102.85	\$108.00
9-12 (< 1,800 pupils)	134	\$119.09	\$125.04
9-12 (> 1,800 pupils)	125	\$119.09	\$125.04

Source: Arizona School Facilities Board, May 2001.

While a district can only receive funding for basic capital improvements and new construction through the School Facilities Board, each district also maintains the ability to raise local funds through limited general obligation bonding and capital overrides. Depending on the decision of the electorate in each district to increase capital funding through increased property taxation, it is possible for some districts to have higher levels of capital funding in spite of the legislation to provide equalization. However, the Students FIRST initiative through the SFB guarantees minimum spending standards for capital projects throughout the state.

9.2 Operations Funding

Operations for education are publicly funded and property tax is generally considered the main revenue source. There are several mechanisms used to equalize spending across the districts statewide. Most operation and maintenance funding is dispersed based on student enrollment and type of district. As seen in the previous section, capital funding is also equalized through the School Facilities Board. Equalization prevents districts with a less affluent tax base from receiving less funding, and hence, inferior quality education services.

Total school district funding comes from four different levels – federal, state, county and local. Table 9-3 shows the total operating revenues as well as the share of source contributions by type of district. Federal funds, as well as many state funds, are administered by the state for the purpose of special programs such as the Class Size Reduction, Johnson-O'Malley program for American Indian students and Drug Free Schools among many others. While the majority of state revenues come from the general fund and helps balance out additional spending required at the district level, local funding is based primarily on property tax collections.

**TABLE 9-3
PERCENT REVENUE BY SOURCE
ARIZONA EDUCATION FUNDING**

Fiscal Year	Recipient	Total Revenues	Distribution by Source				
			Federal	State	County	Intermediate	Local
1990-91	Total	2,826,107,000	6.50%	45.60%	3.90%		44.00%
1991-92	Total	3,021,949,000	6.50%	45.30%	3.80%		44.40%
1992-93	Total	3,151,501,000	6.30%	44.60%	4.70%		44.40%
1993-94	Total	3,290,684,000	7.00%	44.80%	3.90%		44.30%
1994-95	Total	3,486,916,000	7.00%	47.80%	3.30%		41.90%
1995-96	District	3,808,086,499	7.00%	47.20%	3.10%		42.60%
1995-96	Charter	35,495,925	2.60%	96.90%	0.00%		0.50%
1995-96	Total	3,843,582,424	7.00%	47.70%	3.10%		42.20%
1996-97	District	3,974,660,831	7.20%	48.10%	3.10%		41.60%
1996-97	District Charter Schools	11,523,428	0.80%	44.00%	0.00%	2.80%	52.40%
1996-97	Board Charter Schools	65,945,215	5.50%	88.10%	0.00%	2.90%	3.50%
1996-97	Total	4,052,129,474	7.20%	48.80%	3.00%		41.00%
1997-98	District	4,286,437,065	8.13%	46.97%	3.00%		41.89%
1997-98	District Charter Schools	18,812,464	45.42%	0.23%	0.00%	0.00%	54.36%
1997-98	Board Charter Schools	104,015,724	9.67%	83.45%	0.00%	1.45%	5.42%
1997-98	Total	4,409,265,253	8.33%	47.64%	2.92%	0.03%	41.08%
1998-99	District	4,991,796,831	7.67%	44.34%	2.68%		45.31%
1998-99	District Charter Schools	15,831,861	5.11%	26.32%	0.00%	0.00%	68.57%
1998-99	Board Charter Schools	149,173,733	4.32%	84.22%	0.00%	0.35%	11.11%
1998-99	Total	5,156,802,425	7.57%	45.43%	2.59%	0.01%	44.39%
1999-00	District	5,264,801,274	8.56%	47.15%	2.70%		41.59%
1999-00	District Charter Schools	30,248,324	7.17%	6.00%	0.00%	0.05%	86.78%
1999-00	Board Charter Schools	163,337,837	6.30%	86.72%	0.00%	0.25%	6.73%
1999-00	Total	5,458,387,435	8.48%	48.11%	2.60%	0.01%	40.80%

Source: Arizona Department of Education. "Superintendent's Annual Report." October, 2000.

9.3 School Projections

A series of projections have been completed for school-age population and enrollment growth, additional educational space requirements and cost, and the full cash value of property by district for 2010, 2025, and 2040. The results of this analysis were used to measure the cost of schools on a fee basis on new property, or as a property tax burden on all property.

Current Enrollment

The Arizona Department of Education provided 2000 district-level enrollment by grade, used as the base year for this analysis. Table 9-4 shows Kindergarten to 6th grade, 7th and 8th grade, and 9th through 12th grade enrollment by union high school districts. Table 9-5 also shows district level enrollment by grade cohort, but for unified school districts. Enrollment in unified school districts accounts for slightly more than half of total school enrollment in Maricopa County, about 258,800 students of the 486,760 total student population.

These tables show the differences between rural and urban districts. Rural elementary districts such as Mobile, Sentinel, and Paloma had less than 100 students enrolled in 2000, while urban elementary districts such as Washington and Kyrene have more than 19,000 students. The Mesa Unified District is the largest district with over 73,000 students.

Development is a key driver of population, which affects enrollment. The most significant amount of developable land is located in the rural districts, particularly in the western portion of Maricopa County. As such, the impact on enrollment through the period of the projections is expected to be greatest in rural communities in western Maricopa County.

TABLE 9-4
ENROLLMENT BY UNION HIGH SCHOOL DISTRICT: 2000

	Square Miles	2000 Enrollment			Total
		K-6	7-8	9-12	
AGUA FRIA UNION HS DIST 216	94.55	4,886	1,374	2,255	8,515
Avondale School District 44	28.72	2,447	658		3,105
Litchfield School District 79	65.83	2,439	716		3,155
BUCKEYE UNION HS DISTRICT 201	1,222.27	2,465	658	1,070	4,193
Arlington School District 47	708.11	161	35		196
Buckeye Elem School Dist 33	187.18	1,010	241		1,251
Liberty School District 25	261.66	1,069	321		1,390
Palo Verde School District 49	65.31	225	61		286
GLENDALE UNION HS DISTRICT 205	60.31	28,733	7,437	13,648	49,818
Glendale School District 40	16.38	9,294	2,319		11,613
Washington School District 6	43.93	19,439	5,118		24,557
PHOENIX UHS DISTRICT 210	174.06	69,243	15,921	21,726	106,890
Alhambra School District 68	12.71	11,221	2,332		13,553
Balsz School District 31	8.81	2,543	567		3,110
Cartwright School District 83	14.07	14,600	3,557		18,157
Creighton School District 14	10.27	6,616	1,370		7,986
Isaac School District 5	6.05	6,580	1,513		8,093
Laveen School District 59	27.97	1,273	397		1,670
Madison School District 38	16.28	3,862	1,011		4,873
Murphy School District 21	6.97	1,976	447		2,423
Osborn School District 8	6.88	3,200	799		3,999
Phoenix Elem School District 1	15.61	7,326	1,540		8,866
Riverside School District 2	9.46	160	53		213
Roosevelt School District 66	32.94	8,646	2,057		10,703
Wilson School District 7	6.04	1,240	278		1,518
TEMPE UNION HS DISTRICT 213	163.71	25,178	6,835	10,121	42,134
Kyrene School District 28	128.29	15,217	4,271		19,488
Tempe Elementary School Dist	35.42	9,961	2,564		12,525
TOLLESON UNION HS DISTRICT 214	105.72	9,405	2,572	4,300	16,277
Fowler School District 45	12.74	1,318	297		1,615
Littleton School District 65	30.15	1,090	326		1,416
Pendergast School District 92	18.54	5,789	1,656		7,445
Tolleson School District 17	6.15	1,150	278		1,428
Union School District 62	38.15	58	15		73
ELEMENTARY/UNION TOTAL	1,820.62	139,910	34,797	53,120	227,827

Source: Arizona Department of Education.

**TABLE 9-5
ENROLLMENT BY UNIFIED SCHOOL DISTRICT: 2000**

	Square Miles	2000 Enrollment			Total
		K-6	7-8	9-12	
UNIFIED SCHOOL DISTRICTS					
Cave Creek Unified District 93	143.96	2,267	651	1,110	4,028
Aguila School District 63	283.16	143	26	0	169
Chandler Unified District 80	79.05	12,224	3,147	4,955	20,326
Dysart Unified District 89	125.24	3,212	716	1,009	4,937
Fountain Hills Unified District 9	20.73	1,264	404	743	2,411
Gila Bend Unified District 24	1,162.22	289	86	201	576
Gilbert Unified District 41	60.08	15,253	4,148	7,571	26,972
Higley School District 60	21.87	2,191	635	1,046	3,872
Mesa Unified School District	189.84	41,469	11,035	19,740	72,244
Mobile School District 86	250.50	16	5	0	21
Morristown School District 75	162.25	90	17	0	107
Nadaburg School District 81	72.86	342	108	0	450
Paradise Valley Unified Dst 69	97.24	18,970	5,548	10,107	34,625
Peoria Unified District 11	97.64	17,325	5,147	9,177	31,649
Queen Creek Unif District 95	44.47	790	211	424	1,425
Ruth Fisher School District 90	549.51	273	78	0	351
Scottsdale Unified District 48	83.33	14,688	4,429	8,086	27,203
Sentinel School District 71	468.03	23	9	0	32
Deer Valley Unified Dist 97	368.12	14,855	4,081	6,856	25,792
Paloma Elementary District 94	90.56	65	20	0	85
Wickenburg Unified District 9	687.77	673	242	644	1,559
UNIFIED DISTRICTS TOTAL	5,058.42	146,422	40,743	71,669	258,834
GRAND TOTAL	6,879.04	286,332	75,540	124,789	486,661

Source: Arizona Department of Education.

Projected Enrollment

Table 9-6 shows the Maricopa County school-age population, number of students enrolled in Maricopa County schools, and capture rate by grade cohort from 2000 through 2040. In 2000, districts captured 83 percent of all school-age children in Maricopa County. The capture rate of school-age children may decline slightly as the number of educational alternatives continues to increase.

TABLE 9-6
SCHOOL-AGE POPULATION AND ENROLLMENT BY GRADE COHORT

	2000	2010	2025	2040	% Change 2000-10	% Change 2010-2025	% Change 2025-2040
K-6 Cohort							
School-Age Population	330,293	388,368	516,935	649,911	17.6%	33.1%	25.7%
Enrollment	286,332	333,569	440,625	555,140	16.5%	32.1%	26.0%
Capture Rate	86.7%	85.9%	85.2%	85.4%			
7-8 Cohort							
School-Age Population	87,026	110,629	141,110	182,693	27.1%	27.6%	29.5%
Enrollment	75,540	94,746	120,346	156,463	25.4%	27.0%	30.0%
Capture Rate	86.8%	85.6%	85.3%	85.6%			
9-12 Cohort							
School-Age Population	168,710	221,146	280,265	368,247	31.1%	26.7%	31.4%
Enrollment	124,789	161,548	203,470	270,953	29.5%	26.0%	33.2%
Capture Rate	74.0%	73.1%	72.6%	73.6%			
Total							
School-Age Population	586,029	720,142	938,310	1,200,851	22.9%	30.3%	28.0%
Enrollment	486,661	589,863	764,441	982,556	21.2%	29.6%	28.5%
Capture Rate	83.0%	81.9%	81.5%	81.8%			

Source: Bureau of the Census; Applied Economics, 2003.

*School-Age Population

K-6 - Ages 5 to 11 Years Old

7-8 - Ages 12 to 13 Years Old

9-12 - Ages 14 to 17 Years Old

Through 2040, enrollment in Maricopa County is expected to grow more than 20 percent during each period projected. From 2000 to 2010, enrollment is expected to grow by an average annual rate of 1.9 percent, the largest portion of growth occurring in the 9th to 12th grade cohort. Between 2010 and 2025, enrollment is expected to rise on average by another 1.7 percent. During this period, the most significant growth is expected to occur in the K to 6th grade cohort. The 9th to 12th grade cohort is again expected to grow more than the other cohorts from 2025 to 2040, as projected total enrollment grows an average of 1.7 per year.

Tables 9-7 through 9-9 detail projected enrollment for the union high school districts to the year 2040. Districts currently with low enrollments and projected moderate growth show high percentage increases. Central core districts show little growth and in some case declines as build-out nears and neighborhoods age.

School district enrollment in the western portion of Maricopa County is expected to grow the most through the period of these projections. By 2040, enrollment in districts such as Wickenburg Unified, Gila Bend Unified, Buckeye Union, Ruth Fisher, Sentinel, Paloma, Morristown, and Nadaburg, are projected to grow astronomically. In particular, total enrollment in the Wickenburg Unified School District is projected to increase from about 1,560 students in 2000 to about 53,760 students by 2040. During the same time period, Nadaburg School District enrollment is projected to increase from 450 students to about 21,850 students. Between 2000 and 2040, enrollment in the Buckeye Union School District is expected to increase from about 4,200 students to 88,200 students.

**TABLE 9-7
K TO 6th GRADE ENROLLMENT
UNION HIGH SCHOOL DISTRICTS**

	Kindergarten through 6th Grade Enrollment				% Change	% Change	% Change
	2000	2010	2025	2040	2000-10	2010-25	2025-40
AGUA FRIA UNION HS DIST 216							
Avondale School District 44	2,447	3,182	6,050	7,002	30.0%	90.1%	15.7%
Litchfield School District 79	2,439	4,338	9,313	10,844	77.9%	114.7%	16.4%
BUCKEYE UNION HS DISTRICT 201							
Arlington School District 47	161	144	171	1,979	-10.6%	18.8%	1057.3%
Buckeye Elem School Dist 33	1,010	2,260	5,821	10,842	123.8%	157.6%	86.3%
Liberty School District 25	1,069	3,857	20,469	31,505	260.8%	430.7%	53.9%
Palo Verde School District 49	225	1,523	4,904	7,269	576.9%	222.0%	48.2%
GLENDALE UNION HS DISTRICT 205							
Glendale School District 40	9,294	10,087	9,977	9,911	8.5%	-1.1%	-0.7%
Washington School District 6	19,439	19,370	19,490	19,592	-0.4%	0.6%	0.5%
PHOENIX UHS DISTRICT 210							
Alhambra School District 68	11,221	10,384	10,522	10,530	-7.5%	1.3%	0.1%
Balsz School District 31	2,543	3,211	3,256	3,277	26.3%	1.4%	0.6%
Cartwright School District 83	14,600	13,018	13,057	13,028	-10.8%	0.3%	-0.2%
Creighton School District 14	6,616	6,793	6,986	7,024	2.7%	2.8%	0.5%
Isaac School District 5	6,580	5,820	5,801	5,804	-11.6%	-0.3%	0.1%
Laveen School District 59	1,273	3,871	5,888	6,664	204.1%	52.1%	13.2%
Madison School District 38	3,862	5,152	5,207	5,251	33.4%	1.1%	0.8%
Murphy School District 21	1,976	1,947	1,964	1,982	-1.5%	0.9%	0.9%
Osborn School District 8	3,200	4,210	4,310	4,350	31.6%	2.4%	0.9%
Phoenix Elem School District 1	7,326	8,027	8,554	8,712	9.6%	6.6%	1.8%
Riverside School District 2	160	860	1,819	1,968	437.5%	111.5%	8.2%
Roosevelt School District 66	8,646	10,928	12,445	12,438	26.4%	13.9%	-0.1%
Wilson School District 7	1,240	1,361	1,429	1,448	9.8%	5.0%	1.3%
TEMPE UNION HS DISTRICT 213							
Kyrene School District 28	15,217	12,852	12,897	13,204	-15.5%	0.4%	2.4%
Tempe Elementary School Dist	9,961	12,441	12,695	12,974	24.9%	2.0%	2.2%
TOLLESON UNION HS DISTRICT 214							
Fowler School District 45	1,318	2,803	3,426	3,554	112.7%	22.2%	3.7%
Littleton School District 65	1,090	3,022	5,522	6,284	177.2%	82.7%	13.8%
Pendergast School District 92	5,789	6,042	6,549	6,522	4.4%	8.4%	-0.4%
Tolleson School District 17	1,150	1,331	1,385	1,371	15.7%	4.1%	-1.0%
Union School District 62	58	454	1,253	1,713	682.8%	176.0%	36.7%

TABLE 9-7 (CONTINUED)
K TO 6th GRADE ENROLLMENT
UNIFIED SCHOOL DISTRICTS

	Kindergarten through 6th Grade Enrollment				% Change	% Change	% Change
	2000	2010	2025	2040	2000-10	2010-25	2025-40
UNIFIED SCHOOL DISTRICTS							
Cave Creek Unified District 93	2,267	4,193	5,506	5,685	85.0%	31.3%	3.3%
Aguila School District 63	143	140	188	548	-2.1%	34.3%	191.5%
Chandler Unified District 80	12,224	16,167	20,367	20,332	32.3%	26.0%	-0.2%
Dysart Unified District 89	3,212	10,379	18,268	26,422	223.1%	76.0%	44.6%
Fountain Hills Unified District 9	1,264	1,762	2,092	2,075	39.4%	18.7%	-0.8%
Gila Bend Unified District 24	289	287	1,063	5,138	-0.7%	270.4%	383.3%
Gilbert Unified District 41	15,253	14,847	17,230	17,121	-2.7%	16.1%	-0.6%
Higley School District 60	2,191	3,568	6,725	7,083	62.8%	88.5%	5.3%
Mesa Unified School District	41,469	43,790	46,320	46,448	5.6%	5.8%	0.3%
Mobile School District 86	16	10	100	1,550	-37.5%	900.0%	1450.0%
Morristown School District 75	90	129	1,075	4,107	43.3%	733.3%	282.0%
Nadaburg School District 81	342	886	3,538	12,680	159.1%	299.3%	258.4%
Paradise Valley Unified Dst 69	18,970	21,703	26,166	26,253	14.4%	20.6%	0.3%
Peoria Unified District 11	17,325	19,041	23,434	26,458	9.9%	23.1%	12.9%
Queen Creek Unif District 95	790	1,102	5,161	5,594	39.5%	368.3%	8.4%
Ruth Fisher School District 90	273	435	3,842	18,286	59.3%	783.2%	376.0%
Scottsdale Unified District 48	14,688	16,406	16,701	16,542	11.7%	1.8%	-1.0%
Sentinel School District 71	23	8	138	7,961	-65.2%	1625.0%	5668.8%
Deer Valley Unified Dist 97	14,855	18,594	34,471	43,255	25.2%	85.4%	25.5%
Paloma Elementary District 94	65	56	109	827	-13.8%	94.6%	658.7%
Wickenburg Unified District 9	673	724	3,406	25,630	7.6%	370.4%	652.5%
<Unorganized>	0	54	3,565	8,103	100.0%	6501.9%	127.3%
TOTAL	286,332	333,569	440,625	555,140	100.0%	32.1%	26.0%

Source: Arizona Department of Education; Applied Economics, 2003.

TABLE 9-8
7th TO 8th GRADE ENROLLMENT
UNION HIGH SCHOOL DISTRICTS

	7th and 8th Grade Enrollment				% Change		
	2000	2010	2025	2040	2000-10	2010-25	2025-40
AGUA FRIA UNION HS DIST 216							
Avondale School District 44	658	938	1,729	2,065	42.6%	84.3%	19.4%
Litchfield School District 79	716	1,221	2,472	2,958	70.5%	102.5%	19.7%
BUCKEYE UNION HS DISTRICT 201							
Arlington School District 47	35	33	39	544	-5.7%	18.2%	1294.9%
Buckeye Elem School Dist 33	241	550	1,397	2,687	128.2%	154.0%	92.3%
Liberty School District 25	321	1,147	5,841	9,263	257.3%	409.2%	58.6%
Palo Verde School District 49	61	402	1,226	1,868	559.0%	205.0%	52.4%
GLENDALE UNION HS DISTRICT 205							
Glendale School District 40	2,319	2,635	2,504	2,560	13.6%	-5.0%	2.2%
Washington School District 6	5,118	5,326	5,144	5,324	4.1%	-3.4%	3.5%
PHOENIX UHS DISTRICT 210							
Alhambra School District 68	2,332	2,714	2,640	2,721	16.4%	-2.7%	3.1%
Balsz School District 31	567	814	797	825	43.6%	-2.1%	3.5%
Cartwright School District 83	3,557	3,375	3,249	3,340	-5.1%	-3.7%	2.8%
Creighton School District 14	1,370	1,754	1,733	1,798	28.0%	-1.2%	3.8%
Isaac School District 5	1,513	1,484	1,413	1,462	-1.9%	-4.8%	3.5%
Laveen School District 59	397	1,103	1,604	1,866	177.8%	45.4%	16.3%
Madison School District 38	1,011	1,358	1,320	1,371	34.3%	-2.8%	3.9%
Murphy School District 21	447	497	487	502	11.2%	-2.0%	3.1%
Osborn School District 8	799	1,097	1,083	1,129	37.3%	-1.3%	4.2%
Phoenix Elem School District 1	1,540	2,042	2,093	2,190	32.6%	2.5%	4.6%
Riverside School District 2	53	249	498	555	369.8%	100.0%	11.4%
Roosevelt School District 66	2,057	3,043	3,328	3,424	47.9%	9.4%	2.9%
Wilson School District 7	278	299	306	321	7.6%	2.3%	4.9%
TEMPE UNION HS DISTRICT 213							
Kyrene School District 28	4,271	4,059	3,921	4,113	-5.0%	-3.4%	4.9%
Tempe Elementary School Dist	2,564	3,576	3,508	3,685	39.5%	-1.9%	5.0%
TOLLESON UNION HS DISTRICT 214							
Fowler School District 45	297	823	980	1,047	177.1%	19.1%	6.8%
Littleton School District 65	326	867	1,491	1,741	166.0%	72.0%	16.8%
Pendergast School District 92	1,656	1,874	1,951	1,996	13.2%	4.1%	2.3%
Tolleson School District 17	278	361	355	365	29.9%	-1.7%	2.8%
Union School District 62	15	127	337	474	746.7%	165.4%	40.7%
UNIFIED SCHOOL DISTRICTS							
Cave Creek Unified District 93	651	1,269	1,576	1,672	94.9%	24.2%	6.1%
Aguila School District 63	26	25	37	131	-3.8%	48.0%	254.1%
Chandler Unified District 80	3,147	4,533	5,533	5,690	44.0%	22.1%	2.8%
Dysart Unified District 89	716	2,837	4,849	7,256	296.2%	70.9%	49.6%
Fountain Hills Unified District 9	404	443	510	524	9.7%	15.1%	2.7%
Gila Bend Unified District 24	86	95	315	1,526	10.5%	231.6%	384.4%
Gilbert Unified District 41	4,148	4,415	4,931	5,046	6.4%	11.7%	2.3%
Higley School District 60	635	1,064	1,887	2,029	67.6%	77.3%	7.5%
Mesa Unified School District	11,035	11,930	12,127	12,517	8.1%	1.7%	3.2%
Mobile School District 86	5	5	24	358	0.0%	380.0%	1391.7%
Morristown School District 75	17	49	301	1,155	188.2%	514.3%	283.7%
Nadaburg School District 81	108	293	1,060	3,846	171.3%	261.8%	262.8%
Paradise Valley Unified Dst 69	5,548	6,808	7,831	8,079	22.7%	15.0%	3.2%
Peoria Unified District 11	5,147	5,973	6,942	7,962	16.0%	16.2%	14.7%
Queen Creek Unif District 95	211	332	1,408	1,571	57.3%	324.1%	11.6%
Ruth Fisher School District 90	78	123	1,036	5,089	57.7%	742.3%	391.2%
Scottsdale Unified District 48	4,429	4,998	4,875	4,969	12.8%	-2.5%	1.9%
Sentinel School District 71	9	4	46	2,759	-55.6%	1050.0%	5897.8%
Deer Valley Unified Dist 97	4,081	5,388	9,568	12,358	32.0%	77.6%	29.2%
Paloma Elementary District 94	20	19	33	233	-5.0%	73.7%	606.1%
Wickenburg Unified District 9	242	306	1,018	7,208	26.4%	232.7%	608.1%
<Unorganized>	0	69	993	2,291	-	1339.1%	130.7%
TOTAL	75,540	94,746	120,346	156,463	25.4%	27.0%	30.0%

Source: Arizona Department of Education; Applied Economics, 2003.

TABLE 9-9
9th TO 12th GRADE ENROLLMENT

	9th through 12th Grade Enrollment				% Change	% Change	% Change
	2000	2010	2025	2040	2000-10	2010-25	2025-40
HIGH SCHOOL DISTRICTS							
Agua Fria Union Hs Dist 216	2,255	4,124	7,830	9,437	82.9%	89.9%	20.5%
Buckeye Union Hs District 201	1,070	3,497	12,949	22,253	226.8%	270.3%	71.9%
Glendale Union Hs District 205	13,648	14,535	13,778	14,345	6.5%	-5.2%	4.1%
Phoenix Uhs District 210	21,726	26,577	27,242	28,853	22.3%	2.5%	5.9%
Tempe Union Hs District 213	10,121	9,433	9,009	9,640	-6.8%	-4.5%	7.0%
Tolleson Union Hs District 214	4,300	7,545	9,377	10,408	75.5%	24.3%	11.0%
UNIFIED SCHOOL DISTRICTS							
Cave Creek Unified District 93	1,110	2,467	3,026	3,243	122.3%	22.7%	7.2%
Aguila School District 63	0	2	21	177	-	950.0%	742.9%
Chandler Unified District 80	4,955	8,045	9,702	10,071	62.4%	20.6%	3.8%
Dysart Unified District 89	1,009	4,470	7,675	11,759	343.0%	71.7%	53.2%
Fountain Hills Unified District 9	743	1,168	1,277	1,319	57.2%	9.3%	3.3%
Gila Bend Unified District 24	201	207	616	2,959	3.0%	197.6%	380.4%
Gilbert Unified District 41	7,571	9,137	10,100	10,426	20.7%	10.5%	3.2%
Higley School District 60	1,046	1,905	3,582	3,904	82.1%	88.0%	9.0%
Mesa Unified School District	19,740	22,049	22,121	23,043	11.7%	0.3%	4.2%
Mobile School District 86	0	0	31	572	-	-	1745.2%
Morristown School District 75	0	40	437	1,841	-	992.5%	321.3%
Nadaburg School District 81	0	258	1,307	5,325	-	406.6%	307.4%
Paradise Valley Unified Dst 69	10,107	12,813	14,655	15,272	26.8%	14.4%	4.2%
Peoria Unified District 11	9,177	11,453	13,222	15,361	24.8%	15.4%	16.2%
Queen Creek Unif District 95	424	735	2,954	3,331	73.3%	301.9%	12.8%
Ruth Fisher School District 90	0	78	1,218	6,415	-	1461.5%	426.7%
Scottsdale Unified District 48	8,086	10,389	10,016	10,300	28.5%	-3.6%	2.8%
Sentinel School District 71	0	0	55	3,648	-	-	6532.7%
Deer Valley Unified Dist 97	6,856	9,564	16,324	21,084	39.5%	70.7%	29.2%
Paloma Elementary District 94	0	-1	17	282	-	-1800.0%	1558.8%
Wickenburg Unified District 9	644	820	2,859	20,924	27.3%	248.7%	631.9%
<Unorganized>	0	238	2,070	4,761	-	769.7%	130.0%
TOTAL	124,789	161,548	203,470	270,953	29.5%	26.0%	33.2%

Source: Arizona Department of Education; Applied Economics, 2003.

Facility Space and Cost Projections

The School Facilities Board creates statewide capital facilities standards for construction of new schools. These standards dictate the amount of educational space required per pupil, and the cost per square foot that determines the amount of funding available for the construction of new facilities. Important to note, space used by districts, other than classrooms, including administrative or maintenance facilities, are not subject to these standards or funding by the School Facilities Board. As shown in Table 9-2, 100 square feet of academic classroom space is currently specified per pupil in each grade cohort. The cost per square feet, on the other hand, varies depending on location, size, and grade cohort and accounts for higher construction costs in rural areas. The school size, or the number of schools, is not accounted for in this analysis since it is concerned with the additional total square feet demanded, rather than facility sizes that vary by district.

Overall, school districts in Maricopa County are projected to need an additional 10 million square feet of educational space by 2010, almost 28 million square feet by 2025, and about 50 million square feet by 2040. This translates into \$1.2 billion needed to cover the cost of additional space by 2010, \$2.9 Billion by 2025, and \$5.3 billion by 2040. The K to 6th grade cohort is the largest group, and will need the most additional space through each period. As a result, the cost for new K to 6th grade facilities is expected to exceed other cohorts, as well.

Tables 9-10 through 9-12 provide detail on projected costs for each district. Strongly correlated to enrollment projections, those districts with the greatest increase in enrollments by 2040 are also expected to have the greatest costs for additional facilities: Wickenburg Unified, Gila Bend Unified, Buckeye Union, Ruth Fisher, Sentinel, Paloma, Morristown, and Nadaburg.

TABLE 9-10
COST OF ADDITIONAL K TO 6th GRADE FACILITIES
UNION HIGH SCHOOL DISTRICTS

	Change in Space Requirements from Year 2000			Cost of Additional K-6th Grade Facilities		
	2010	2025	2040	2010	2025	2040
AGUA FRIA UNION HS DIST 216						
Avondale School District 44	73,500	360,300	455,500	\$7,161,105	\$35,104,029	\$44,379,365
Litchfield School District 79	189,900	687,400	840,500	\$18,501,957	\$66,973,382	\$81,889,915
BUCKEYE UNION HS DISTRICT 201						
Arlington School District 47	-1,700	1,000	181,800	\$0	\$97,430	\$17,712,774
Buckeye Elem School Dist 33	125,000	481,100	983,200	\$12,178,750	\$46,873,573	\$95,793,176
Liberty School District 25	278,800	1,940,000	3,043,600	\$27,163,484	\$189,014,200	\$296,537,948
Palo Verde School District 49	129,800	467,900	704,400	\$12,646,414	\$45,587,497	\$68,629,692
GLENDALE UNION HS DISTRICT 205						
Glendale School District 40	79,300	68,300	61,700	\$7,726,199	\$6,654,469	\$6,011,431
Washington School District 6	-6,900	5,100	15,300	\$0	\$496,893	\$1,490,679
PHOENIX UHS DISTRICT 210						
Alhambra School District 68	-83,700	-69,900	-69,100	\$0	\$0	\$0
Balsz School District 31	66,800	71,300	73,400	\$6,508,324	\$6,946,759	\$7,151,362
Cartwright School District 83	-158,200	-154,300	-157,200	\$0	\$0	\$0
Creighton School District 14	17,700	37,000	40,800	\$1,724,511	\$3,604,910	\$3,975,144
Isaac School District 5	-76,000	-77,900	-77,600	\$0	\$0	\$0
Laveen School District 59	259,800	461,500	539,100	\$25,312,314	\$44,963,945	\$52,524,513
Madison School District 38	129,000	134,500	138,900	\$12,568,470	\$13,104,335	\$13,533,027
Murphy School District 21	-2,900	-1,200	600	\$0	\$0	\$58,458
Osborn School District 8	101,000	111,000	115,000	\$9,840,430	\$10,814,730	\$11,204,450
Phoenix Elem School District 1	70,100	122,800	138,600	\$6,829,843	\$11,964,404	\$13,503,798
Riverside School District 2	70,000	165,900	180,800	\$6,820,100	\$16,163,637	\$17,615,344
Roosevelt School District 66	228,200	379,900	379,200	\$22,233,526	\$37,013,657	\$36,945,456
Wilson School District 7	12,100	18,900	20,800	\$1,178,903	\$1,841,427	\$2,026,544
TEMPE UNION HS DISTRICT 213						
Kyrene School District 28	-236,500	-232,000	-201,300	\$0	\$0	\$0
Tempe Elementary School Dist	248,000	273,400	301,300	\$24,162,640	\$26,637,362	\$29,355,659
TOLLESON UNION HS DISTRICT 214						
Fowler School District 45	148,500	210,800	223,600	\$14,468,355	\$20,538,244	\$21,785,348
Littleton School District 65	193,200	443,200	519,400	\$18,823,476	\$43,180,976	\$50,605,142
Pendergast School District 92	25,300	76,000	73,300	\$2,464,979	\$7,404,680	\$7,141,619
Tolleson School District 17	18,100	23,500	22,100	\$1,763,483	\$2,289,605	\$2,153,203
Union School District 62	39,600	119,500	165,500	\$3,858,228	\$11,642,885	\$16,124,665

TABLE 9-10 (CONTINUED)
COST OF ADDITIONAL K TO 6th GRADE FACILITIES
UNIFIED SCHOOL DISTRICTS

	Change in Space Requirements from Year 2000			Cost of Additional K-6th Grade Facilities		
	2010	2025	2040	2010	2025	2040
UNIFIED SCHOOL DISTRICTS						
Cave Creek Unified District 93	192,600	323,900	341,800	\$18,765,018	\$31,557,577	\$33,301,574
Aguila School District 63	-300	4,500	40,500	\$0	\$438,435	\$3,945,915
Chandler Unified District 80	394,300	814,300	810,800	\$38,416,649	\$79,337,249	\$78,996,244
Dysart Unified District 89	716,700	1,505,600	2,321,000	\$69,828,081	\$146,690,608	\$226,135,030
Fountain Hills Unified District 9	49,800	82,800	81,100	\$4,852,014	\$8,067,204	\$7,901,573
Gila Bend Unified District 24	-200	77,400	484,900	\$0	\$7,541,082	\$47,243,807
Gilbert Unified District 41	-40,600	197,700	186,800	\$0	\$19,261,911	\$18,199,924
Higley School District 60	137,700	453,400	489,200	\$13,416,111	\$44,174,762	\$47,662,756
Mesa Unified School District	232,100	485,100	497,900	\$22,613,503	\$47,263,293	\$48,510,397
Mobile School District 86	-600	8,400	153,400	\$0	\$818,412	\$14,945,762
Morristown School District 75	3,900	98,500	401,700	\$379,977	\$9,596,855	\$39,137,631
Nadaburg School District 81	54,400	319,600	1,233,800	\$5,300,192	\$31,138,628	\$120,209,134
Paradise Valley Unified Dst 69	273,300	719,600	728,300	\$26,627,619	\$70,110,628	\$70,958,269
Peoria Unified District 11	171,600	610,900	913,300	\$16,718,988	\$59,519,987	\$88,982,819
Queen Creek Unif District 95	31,200	437,100	480,400	\$3,039,816	\$42,586,653	\$46,805,372
Ruth Fisher School District 90	16,200	356,900	1,801,300	\$1,578,366	\$34,772,767	\$175,500,659
Scottsdale Unified District 48	171,800	201,300	185,400	\$16,738,474	\$19,612,659	\$18,063,522
Sentinel School District 71	-1,500	11,500	793,800	\$0	\$1,120,445	\$77,339,934
Deer Valley Unified Dist 97	373,900	1,961,600	2,840,000	\$36,429,077	\$191,118,688	\$276,701,200
Paloma Elementary District 94	-900	4,400	76,200	\$0	\$428,692	\$7,424,166
Wickenburg Unified District 9	5,100	273,300	2,495,700	\$496,893	\$26,627,619	\$243,156,051
<Unorganized>	5,400	356,500	810,300	\$526,122	\$34,733,795	\$78,947,529
TOTAL	4,723,700	15,429,300	26,880,800	\$ 519,662,391	\$1,555,430,978	\$2,668,217,980

Source: Applied Economics, 2003.

TABLE 9-11
COST OF ADDITIONAL 7th TO 8th GRADE FACILITIES
UNION HIGH SCHOOL DISTRICTS

District Group & Name	Change in Space Requirements from Year 2000			Cost of Additional 7th-8th Grade Facilities		
	2010	2025	2040	2010	2025	2040
AGUA FRIA UNION HS DIST 216						
Avondale School District 44	28,000	107,100	140,700	\$2,879,800	\$11,015,235	\$14,470,995
Litchfield School District 79	50,500	175,600	224,200	\$5,193,925	\$18,060,460	\$23,058,970
BUCKEYE UNION HS DISTRICT 201						
Arlington School District 47	-200	400	50,900	\$0	\$41,140	\$5,235,065
Buckeye Elem School Dist 33	30,900	115,600	244,600	\$3,178,065	\$11,889,460	\$25,157,110
Liberty School District 25	82,600	552,000	894,200	\$8,495,410	\$56,773,200	\$91,968,470
Palo Verde School District 49	34,100	116,500	180,700	\$3,507,185	\$11,982,025	\$18,584,995
GLENDALE UNION HS DISTRICT 205						
Glendale School District 40	31,600	18,500	24,100	\$3,250,060	\$1,902,725	\$2,478,685
Washington School District 6	20,800	2,600	20,600	\$2,139,280	\$267,410	\$2,118,710
PHOENIX UHS DISTRICT 210						
Alhambra School District 68	38,200	30,800	38,900	\$3,928,870	\$3,167,780	\$4,000,865
Balsz School District 31	24,700	23,000	25,800	\$2,540,395	\$2,365,550	\$2,653,530
Cartwright School District 83	-18,200	-30,800	-21,700	\$0	\$0	\$0
Creighton School District 14	38,400	36,300	42,800	\$3,949,440	\$3,733,455	\$4,401,980
Isaac School District 5	-2,900	-10,000	-5,100	\$0	\$0	\$0
Laveen School District 59	70,600	120,700	146,900	\$7,261,210	\$12,413,995	\$15,108,665
Madison School District 38	34,700	30,900	36,000	\$3,568,895	\$3,178,065	\$3,702,600
Murphy School District 21	5,000	4,000	5,500	\$514,250	\$411,400	\$565,675
Osborn School District 8	29,800	28,400	33,000	\$3,064,930	\$2,920,940	\$3,394,050
Phoenix Elem School District 1	50,200	55,300	65,000	\$5,163,070	\$5,687,605	\$6,685,250
Riverside School District 2	19,600	44,500	50,200	\$2,015,860	\$4,576,825	\$5,163,070
Roosevelt School District 66	98,600	127,100	136,700	\$10,141,010	\$13,072,235	\$14,059,595
Wilson School District 7	2,100	2,800	4,300	\$215,985	\$287,980	\$442,255
TEMPE UNION HS DISTRICT 213						
Kyrene School District 28	-21,200	-35,000	-15,800	\$0	\$0	\$0
Tempe Elementary School Dist	101,200	94,400	112,100	\$10,408,420	\$9,709,040	\$11,529,485
TOLLESON UNION HS DISTRICT 214						
Fowler School District 45	52,600	68,300	75,000	\$5,409,910	\$7,024,655	\$7,713,750
Littleton School District 65	54,100	116,500	141,500	\$5,564,185	\$11,982,025	\$14,553,275
Pendergast School District 92	21,800	29,500	34,000	\$2,242,130	\$3,034,075	\$3,496,900
Tolleson School District 17	8,300	7,700	8,700	\$853,655	\$791,945	\$894,795
Union School District 62	11,200	32,200	45,900	\$1,151,920	\$3,311,770	\$4,720,815

TABLE 9-11 (CONTINUED)
COST OF ADDITIONAL 7th TO 8th GRADE FACILITIES
UNIFIED SCHOOL DISTRICTS

District Group & Name	Change in Space Requirements from Year 2000			Cost of Additional 7th-8th Grade Facilities		
	2010	2025	2040	2010	2025	2040
UNIFIED SCHOOL DISTRICTS						
Cave Creek Unified District 93	61,800	92,500	102,100	\$6,356,130	\$9,513,625	\$10,500,985
Aguila School District 63	-100	1,100	10,500	\$0	\$113,135	\$1,079,925
Chandler Unified District 80	138,600	238,600	254,300	\$14,255,010	\$24,540,010	\$26,154,755
Dysart Unified District 89	212,100	413,300	654,000	\$21,814,485	\$42,507,905	\$67,263,900
Fountain Hills Unified District 9	3,900	10,600	12,000	\$401,115	\$1,090,210	\$1,234,200
Gila Bend Unified District 24	900	22,900	144,000	\$92,565	\$2,355,265	\$14,810,400
Gilbert Unified District 41	26,700	78,300	89,800	\$2,746,095	\$8,053,155	\$9,235,930
Higley School District 60	42,900	125,200	139,400	\$4,412,265	\$12,876,820	\$14,337,290
Mesa Unified School District	89,500	109,200	148,200	\$9,205,075	\$11,231,220	\$15,242,370
Mobile School District 86	0	1,900	35,300	\$0	\$195,415	\$3,630,605
Morristown School District 75	3,200	28,400	113,800	\$329,120	\$2,920,940	\$11,704,330
Nadaburg School District 81	18,500	95,200	373,800	\$1,902,725	\$9,791,320	\$38,445,330
Paradise Valley Unified Dst 69	126,000	228,300	253,100	\$12,959,100	\$23,480,655	\$26,031,335
Peoria Unified District 11	82,600	179,500	281,500	\$8,495,410	\$18,461,575	\$28,952,275
Queen Creek Unif District 95	12,100	119,700	136,000	\$1,244,485	\$12,311,145	\$13,987,600
Ruth Fisher School District 90	4,500	95,800	501,100	\$462,825	\$9,853,030	\$51,538,135
Scottsdale Unified District 48	56,900	44,600	54,000	\$5,852,165	\$4,587,110	\$5,553,900
Sentinel School District 71	-500	3,700	275,000	\$0	\$380,545	\$28,283,750
Deer Valley Unified Dist 97	130,700	548,700	827,700	\$13,442,495	\$56,433,795	\$85,128,945
Paloma Elementary District 94	-100	1,300	21,300	\$0	\$133,705	\$2,190,705
Wickenburg Unified District 9	6,400	77,600	696,600	\$658,240	\$7,981,160	\$71,645,310
<Unorganized>	6,900	99,300	229,100	\$709,665	\$10,213,005	\$23,562,935
TOTAL	1,920,600	4,480,600	8,092,300	\$ 201,976,830	\$ 468,625,740	\$ 836,674,465

Source: Applied Economics, 2003.

TABLE 9-12
COST OF ADDITIONAL 9th TO 12th GRADE FACILITIES

District Group & Name	Change in Space Requirements from Year 2000			Cost of Additional 9th-12th Grade Facilities		
	2010	2025	2040	2010	2025	2040
HIGH SCHOOL DISTRICTS						
Agua Fria Union Hs Dist 216	186,900	557,500	718,200	\$22,257,921	\$66,392,675	\$85,530,438
Buckeye Union Hs District 201	242,700	1,187,900	2,118,300	\$28,903,143	\$141,467,011	\$252,268,347
Glendale Union Hs District 205	88,700	13,000	69,700	\$10,563,283	\$1,548,170	\$8,300,573
Phoenix Uhs District 210	485,100	551,600	712,700	\$57,770,559	\$65,690,044	\$84,875,443
Tempe Union Hs District 213	-68,800	-111,200	-48,100	\$0	\$0	\$0
Tolleson Union Hs District 214	324,500	507,700	610,800	\$38,644,705	\$60,461,993	\$72,740,172
UNIFIED SCHOOL DISTRICTS						
Cave Creek Unified District 93	135,700	191,600	213,300	\$16,160,513	\$22,817,644	\$25,401,897
Aguila School District 63	200	2,100	17,700	\$23,818	\$250,089	\$2,107,893
Chandler Unified District 80	309,000	474,700	511,600	\$36,798,810	\$56,532,023	\$60,926,444
Dysart Unified District 89	346,100	666,600	1,075,000	\$41,217,049	\$79,385,394	\$128,021,750
Fountain Hills Unified District 9	42,500	53,400	57,600	\$5,061,325	\$6,359,406	\$6,859,584
Gila Bend Unified District 24	600	41,500	275,800	\$71,454	\$4,942,235	\$32,845,022
Gilbert Unified District 41	156,600	252,900	285,500	\$18,649,494	\$30,117,861	\$34,000,195
Higley School District 60	85,900	253,600	285,800	\$10,229,831	\$30,201,224	\$34,035,922
Mesa Unified School District	230,900	238,100	330,300	\$27,497,881	\$28,355,329	\$39,335,427
Mobile School District 86	0	3,100	57,200	\$0	\$369,179	\$6,811,948
Morristown School District 75	4,000	43,700	184,100	\$476,360	\$5,204,233	\$21,924,469
Nadaburg School District 81	25,800	130,700	532,500	\$3,072,522	\$15,565,063	\$63,415,425
Paradise Valley Unified Dst 69	270,600	454,800	516,500	\$32,225,754	\$54,162,132	\$61,509,985
Peoria Unified District 11	227,600	404,500	618,400	\$27,104,884	\$48,171,905	\$73,645,256
Queen Creek Unif District 95	31,100	253,000	290,700	\$3,703,699	\$30,129,770	\$34,619,463
Ruth Fisher School District 90	7,800	121,800	641,500	\$928,902	\$14,505,162	\$76,396,235
Scottsdale Unified District 48	230,300	193,000	221,400	\$27,426,427	\$22,984,370	\$26,366,526
Sentinel School District 71	0	5,500	364,800	\$0	\$654,995	\$43,444,032
Deer Valley Unified Dist 97	270,800	946,800	1,422,800	\$32,249,572	\$112,754,412	\$169,441,252
Paloma Elementary District 94	-100	1,700	28,200	\$0	\$202,453	\$3,358,338
Wickenburg Unified District 9	17,600	221,500	2,028,000	\$2,095,984	\$26,378,435	\$241,514,520
<Unorganized>	23,800	207,000	476,100	\$2,834,342	\$24,651,630	\$56,698,749
TOTAL	3,675,900	7,868,100	14,616,400	\$ 445,968,232	\$ 950,254,837	\$ 1,746,395,305

Source: Applied Economics, 2003.

Part III Fiscal Issues

This part of the report focuses on the relationship between growth and development and the economy within the Phoenix metropolitan region. Revenue sources, their relative importance and flexibility as applied within municipal budgets are reviewed as well.

10. Fiscal Balance

This chapter examines fiscal issues related to land development. In order to understand the fiscal ramifications of planned land use, an order-of-magnitude estimation of fiscal balance of regional land use plans was completed. This chapter provides background information on how different types of development impact communities from a fiscal perspective. Included is an analysis of the revenue structure of local governments in Metro Phoenix relative to the ability to sustain various mixes of development types.

The analysis of future land use plans focuses on the net impacts of residential versus nonresidential uses at the city level. The local revenue information focuses on the types of revenues that are statutorily available to cities in Arizona, highlighting any underutilized sources.

10.1 General Conclusions

A number of important points were derived from a literature review to provide a basis for the fiscal impact model for Maricopa County. The majority of the studies presented in this review support the general view that residential development has a negative fiscal impact on local governments while industrial, hotel, agricultural, and retail uses generate positive impacts. However, most authors note that the results of fiscal analysis according to land use cannot be interpreted in isolation since these land uses do not exist in isolation. Despite the fact that residential development “drains city coffers”, housing at all levels is necessary to provide employment for the commercial and industrial uses. Higher density housing, which generally causes the greatest negative fiscal impact, can reduce sprawl, capital costs, and other negative quality of life factors.

It is also important to remember the individuality of areas when reviewing fiscal impact analyses. The results of a fiscal analysis in one specific area cannot be interpreted as sweeping truths for all new development in any area. The nature of the area, tax structure, and the current capacity of the available facilities are important factors that are unique to a jurisdiction. This is an element of importance for the fiscal impact model for Maricopa County, where the local tax structure and growth patterns differ widely from other places in the United States.

10.2 Local Revenue Sources

Local governments have a fairly limited range of revenue types that can be generated locally. These include transaction privilege and property taxes, as well as various fees for services including user fees, permits and licenses.

For municipalities that currently impose property taxes, there is little underutilized potential for additional revenues, outside of increases in assessed value from market conditions and new development that will yield additional property taxes. Most of the untapped potential for increases in locally controlled revenues is in the various types of privilege taxes including sales taxes on utilities, transient lodging and property leases. Transient lodging tax, which can be imposed on both lodging and restaurants, can provide increased local revenues for cities with this type of development. However, for cities over 100,000, lodging taxes may only generate a

limited amount of unrestricted revenues since taxes above the standard retail sales tax rate must be used for tourism promotion.

Since retail sales taxes generate significant unrestricted local revenues, cities may be tempted to pursue retail development at the expense of office and industrial development. While retail land uses typically generate the most positive fiscal impacts given the tax structure in Arizona, the exclusion of other types of development does not promote balanced communities from an economic perspective.

10.3 Local Taxes

There are two primary types of local tax revenues: property tax and transaction privilege tax. Cities generally break privilege tax into three types: sales tax, utility tax and transient occupancy tax (TOT). Table 10-1 shows tax rates for all incorporated cities in Maricopa County. The cities are listed in descending order by population size.

**TABLE 10-1
LOCAL TAX RATES**

Jurisdiction/Size	Sales Tax	Primary Property Tax	Utility Tax	Lodging Tax*
Extra Large				
Phoenix	1.80%	0.83%	2.70%	3.00%
Large				
Mesa	1.50%	0.00%	1.50%	2.50%
Glendale	1.30%	0.38%	1.30%	3.00%
Scottsdale	1.40%	0.53%	1.40%	3.00%
Chandler	1.50%	0.38%	2.75%	2.90%
Tempe	1.80%	0.55%	1.80%	2.00%
Medium Large				
Gilbert	1.50%	0.00%	1.50%	3.00%
Peoria	1.50%	0.32%	3.00%	3.50%
Medium				
Avondale	1.50%	0.60%	2.00%	2.00%
Surprise	2.00%	0.41%	2.00%	1.00%
Goodyear	2.00%	1.34%	2.00%	2.00%
Fountain Hills	1.60%	0.00%	1.60%	3.00%
Paradise Valley	1.40%	0.00%	1.40%	3.00%
Small				
El Mirage	3.00%	0.00%	3.00%	2.00%
Buckeye	2.00%	0.94%	2.00%	0.00%
Guadalupe	2.00%	0.00%	2.00%	4.00%
Wickenburg	1.00%	0.71%	1.00%	0.00%
Tolleson	2.00%	1.02%	2.00%	2.00%
Litchfield Park	2.00%	0.00%	2.00%	1.00%
Cave Creek	2.50%	0.00%	3.00%	4.00%
Queen Creek	1.00%	0.00%	1.00%	1.00%
Youngtown	2.00%	0.00%	2.00%	2.00%
Carefree	2.00%	0.00%	2.00%	3.00%
Gila Bend	3.00%	1.64%	3.00%	2.00%
Maricopa County	0.00%	1.17%	0.00%	0.57%

Source: Arizona Department of Revenue; city budgets.

*Lodging tax rate is in addition to sales tax. All tax rates include general fund portions only.

Sales tax rates in Maricopa County range from 1 to 3 percent. The county imposes an

additional 0.7 percent tax, although none of these revenues are captured in the County's general fund. In general, smaller cities and cities without property taxes tend to have higher sales tax rates. However, there are exceptions. Gila Bend, a small town, has one of the highest local sales tax rates and the highest primary property tax rate. Queen Creek, also a small town, has no local property tax, and a sales tax rate of only one percent. Mesa, a large city, also has no local property tax and a relatively low sales tax rate. However, Mesa is also one of the few cities in Arizona with a municipal electric and gas utility (serving the city's downtown area) that generates substantial local revenues.

Property tax rates shown in the table include only the primary tax or the portion that goes into the general fund for unrestricted use. Local rates range from 0 percent to 1.64 percent. County property taxes are in addition to local taxes in incorporated areas. Gila Bend, Goodyear, Tolleson and Buckeye have the highest rates ranging from 0.94 percent to 1.64 percent. All of these cities also have relatively low assessed value per capita meaning that higher mill rates are required to generate sufficient tax revenues.

10.4 Local and Non-Local Revenues

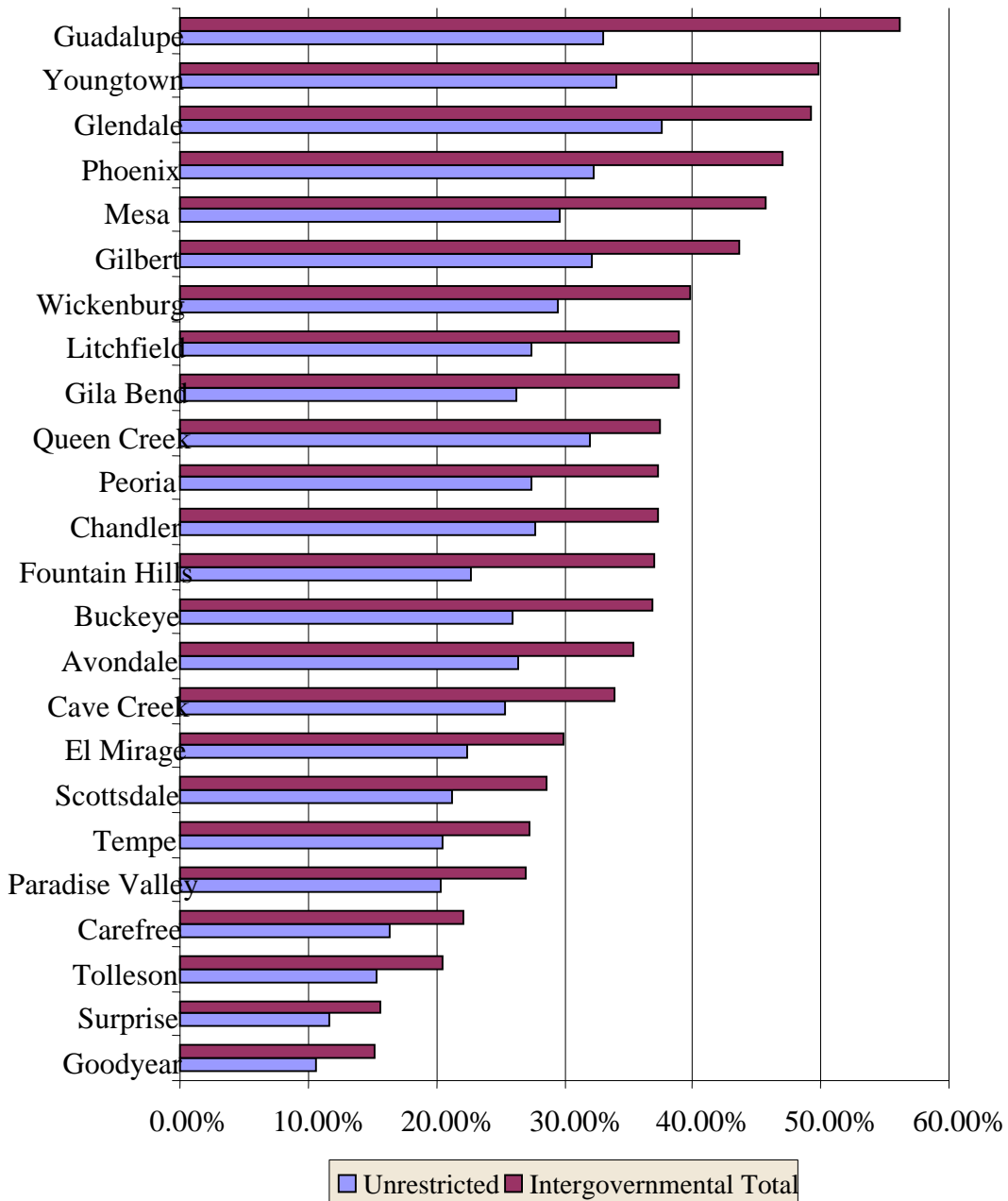
Cities utilize a variety of types of revenues, some of which are under local control and some of which are distributed by other government entities such as the state. The taxes described above are generally locally controlled in terms of cities being able to set rates for various business categories. Service charges, fines, licenses and permits are other examples of locally controlled revenues.

Non-local or intergovernmental revenue sources include state shared income and sales tax, auto lieu tax, federal, state and local grants, highway user revenues and lottery funds. Figure 10-1 shows intergovernmental revenues as a share of total general fund and transportation fund revenues.¹

Typically state shared income and sales tax and motor vehicle in-lieu combined make up 11 to 38 percent of local operating budgets for cities in Maricopa County. This translates into an average of \$176 per capita per year. These three sources are unrestricted general fund revenues. Unfortunately for many cities, state shared income and sales taxes are distributed based on Census population. The amount of revenues distributed varies each year depending on the total amount of state taxes collected. However, for cities that are adding large amounts of residential development there is a one to five year lag before state shared revenues will catch up to current resident population.

¹ Transportation or streets funds are used to capture highway user revenues and pay for local street maintenance expenditures.

FIGURE 10-1
SHARE OF INTERGOVERNMENTAL REVENUES



Total intergovernmental revenues, including grants and funds that are specifically for transportation make up between 15 and 56 percent of local budgets. There does not seem to be a particular pattern in terms of city size. For Guadalupe and Youngtown, intergovernmental revenues make up 50 to 56 percent of operating resources. Neither of these towns have a local property tax. However, the next group of cities for whom intergovernmental revenues make up

44 to 49 percent of operating resources are all large cities including Phoenix, Mesa, Glendale and Gilbert. Tempe, in contrast, is only dependent on intergovernmental revenues for 27 percent of its general and transportation funds.

Generally, the problem with intergovernmental revenues is that while they have been a reliable source of revenues for cities in the past, they can be impacted by changes in state legislation at any time. The Arizona League of Cities has been active in lobbying against any reductions in state shared revenues. The other issue is timing as noted above. These revenues cover a large portion of the cost of supporting residential development. For fast growing cities, particularly small cities, the lag in adjusting distribution formulas for state shared income and sales tax can strain local budgets.

10.5 Modeling Fiscal Impacts

A generalized fiscal impact model for Maricopa County was created to show net impacts for four time periods: 2000, 2010, 2040 and build out. Results from the draft model are included to show the net impact of one developed acre of residential, office, industrial and retail development in each city.

Land use is the driver for the Maricopa County fiscal impact model. The model uses locally adopted General Plans as the basis for future land use and assesses the fiscal impacts of the planned uses at build-out.

The fiscal model yields valuable information about how different types of development are likely to impact city budgets. These preliminary results show how the tax structure in Arizona as well as differences among individual cities are manifested in land use and planning decisions.

The results of modeling indicate that cities must have a balanced mix of land uses for both economic and fiscal reasons. Residential development in isolation is not generally feasible. However, residential development is necessary to support demand for retail, and to create a labor pool for office and industrial uses. At the same time, retail development as the primary type of non-residential development in a community would create a strong fiscal impact, but would not result in a healthy economic base. The complexity within a contiguous urban area like Maricopa County stems from the fact that development patterns do not necessarily conform to city boundaries. When residents can easily work or shop in a neighboring community, it is possible for some cities to develop with an unbalanced mix of land uses that threaten fiscal sustainability. The fiscal impact model is a useful tool in illustrating how growth patterns in individual cities will impact local budgets in the long term.

10.6 Fiscal Balance

Model results for year 2000 and build out reveal some interesting growth patterns in the different cities. Some cities are much closer to build out than others, and will not experience significant changes. Many of the outlying areas will experience significant population and employment growth, but in cases where population growth greatly outweighs employment growth there are usually fiscal consequences.

The results of the model analysis are summarized in Table 10-2. Table 10-2 indicates the percentage difference between revenues and expenditures. Note that the model includes much more detailed revenue and expenditure information than what is shown in this summary table.

**TABLE 10-2
SUMMARY OF MODEL RESULTS BY CITY**

Jurisdiction	2000 Fiscal Balance*	Buildout Fiscal Balance
Avondale	16%	43%
Buckeye	5%	62%
Carefree	20%	42%
Cave Creek	9%	31%
Chandler	19%	29%
El Mirage	21%	41%
Fountain Hills	0%	18%
Gila Bend	3%	56%
Gilbert	-2%	16%
Glendale	-3%	11%
Goodyear	30%	34%
Guadalupe	30%	41%
Litchfield Park	39%	32%
Mesa	19%	32%
Paradise Valley	31%	40%
Peoria	14%	32%
Phoenix	0%	5%
Queen Creek	-10%	15%
Scottsdale	32%	34%
Surprise	22%	13%
Tempe	36%	42%
Tolleson	35%	66%
Wickenburg	20%	15%
Youngtown	3%	12%
Unincorporated County	2%	-2%

*Fiscal balance refers to the difference between municipal revenues and expenditures and is represented here as a percentage. For Maricopa region jurisdictions, revenues generally exceed expenditures; where they do not, the figure in the table is negative.

In almost all cases revenues exceed expenditures in the model results. For 2000, this is generally due to the fact that the actual revenues represented in the model exceeded expenditures for many of the cities, based on the totals from the 2000-2001 budgets used to develop the rates. In most cities, unrestricted revenues are transferred out of the general fund to support operations in other funds. However, interfund transfers are not included in this model. For Phoenix, the only very large city, the model is initially balanced since there are no multi-city averages for this size category. The same is true for the county. For large cities, actual revenues exceeded expenditures by 13 percent on average. For medium large sized cities, actual revenues exceeded expenditures by 29 percent on average. For medium sized cities, actual revenues exceeded expenditures by 39 percent on average. For small cities actual revenues exceeded expenditures by an average of 18 percent².

At build out, many of the cities show a substantial increase in the ratio of revenues to expenditures. In some cases this may be due to the increased level of retail development. Although retail development is very positive from a fiscal perspective, the level of planned retail development at the regional level may not be feasible from a market perspective. This may apply to other commercial uses as well, significantly over-stating employment in some MPAs.

² Note that the percentages described above apply to the actual information that was derived from the city budgets and used to develop the rates, not the model results.

11. Sales Tax Generation

This chapter reviews sales taxes and sales tax base conditions and trends in the Phoenix metro area.

Sales tax, or transactions privilege tax as it is called in Arizona, is a very important revenue source for local cities and towns, often representing the largest revenue source for a community that is largely within its own control. A ½ cent, soon to expire, Maricopa County Sales tax is also the primary mechanism for funding the regional transportation system. According to city budgets for communities in Maricopa County for 1999/00 and 2000/01, sales tax comprised from 20 percent to 55 percent of total local operating revenue.

Retail sales comprise about 52 percent of all sales tax collections countywide, and are also the largest single source of sales tax for most communities. The retail share of total sales tax collections varies from just 3 percent in Paradise Valley (which has virtually no retail space), to 70 percent in Glendale and Wickenburg. Most of the larger, and more developed communities run in the range of 40 to 60 percent. Other sources of sales tax collections include construction, utilities, real property rentals, hotel/motel sales and “other” taxable sales, each comprising 13 percent or less of collections countywide, as shown in Table 11-1.

**TABLE 11-1
TRANSACTIONS PRIVILEGE TAX COLLECTIONS BY SOURCE BY MPA**

	Retail	Construction	Utilities	Property	Hotel	Other	Total
Avondale	54%	33%	4.41%	4%	0%	5%	\$7,537,278
Buckeye	31%	35%	11.01%			23%	\$1,445,838
Carefree	27%	31%	9.74%			33%	\$1,905,320
Cave Creek	34%	23%	12.72%			30%	\$1,752,850
Chandler	45%	20%	17.48%	7%	3%	7%	\$50,139,195
El Mirage	17%	67%	5.01%			11%	\$2,602,370
Fountain Hills	30%	46%	8.67%			16%	\$4,032,412
Gila Bend	61%	0%	23.82%			15%	\$623,419
Gilbert	48%	26%	8.02%			18%	\$15,760,767
Glendale	70%	11%	5.47%	10%	0%	3%	\$39,967,369
Goodyear	46%	27%	2.51%			24%	\$8,829,981
Guadalupe	36%	0%	27.11%			37%	\$717,364
Litchfield Park	4%	13%	5.06%			78%	\$1,223,954
Mesa	66%	13%	8.37%	11%	0%	2%	\$104,206,835
Paradise Valley	3%	22%	3.63%		51%	21%	\$7,424,259
Peoria	64%	22%	5.15%	5%	2%	2%	\$20,354,449
Phoenix	48%	8%	16.08%	7%	9%	12%	\$382,957,201
Queen Creek	24%	37%	12.61%			26%	\$564,653
Scottsdale	53%	21%	4.55%	10%	6%	6%	\$111,914,847
Surprise	21%	61%	6.07%		1%	11%	\$10,480,269
Tempe	60%	7%	9.10%	12%	4%	8%	\$95,437,259
Tolleson	40%	32%	13.91%			14%	\$2,924,863
Wickenburg	70%	10%	5.82%		2%	13%	\$1,073,251
Youngtown	30%	9%	6.92%			54%	\$382,128
Average/Total	52%	13%	12%	8%	6%	9%	\$874,258,130

Construction-related sales tax is the largest of the non-retail sources, representing 13 percent of sales tax collections in Maricopa County. Fast growing, edge communities often have a greater share of sales tax from construction than from retail sales. This is currently true in Buckeye, El

Mirage, Fountain Hills, Queen Creek and Surprise. In the case of Surprise and El Mirage, construction comprises over 60 percent of all taxable sales. Dependency on this source is to be expected in the early stages of growth; however communities must be careful not to become dependent on it in the long-term as it will surely decline.

Net Surplus/Leakage Results at Build-Out

Table 11-2 shows the total retail demand and potential sales by MPA at build-out. Overall, Maricopa County contains the potential for about \$72 billion in annual retail demand at build-out, compared with potential retail sales of about \$115 billion annually. The difference, about \$43 billion, or about 60 percent, is the direct result of over-supply of retail land in the County. Fortunately, just three jurisdictions including Buckeye, Mesa and the SRPMIC, comprise 96 percent of the total expected over-supply, showing balance among many of the other communities in Maricopa County.

TABLE 11-2
RETAIL DEMAND AND SALES BY MPA
“BUILD-OUT”

MPA	Retail Demand (Millions)					Potential	Net Surplus/Leakage	
	Residents		Visitors *			Retail Sales	(Millions)	Percent
	Households	Business	Transient	Seasonal	Total	(Millions)		
Avondale	599.68	250.93	15.75	1.43	867.79	1833.03	965.23	111.2%
Buckeye	5103.50	1431.06	59.54	1.89	6595.99	38817.31	32221.32	488.5%
Carefree	58.18	8.31	10.40	1.12	78.02	96.48	18.47	23.7%
Cave Creek	112.16	7.57	3.50	0.39	123.62	166.26	42.64	34.5%
Chandler	2273.26	485.34	122.34	6.51	2887.46	4445.25	1557.79	54.0%
County Areas	8056.88	539.21	64.94	18.83	8679.86	1690.96	-6988.90	-80.5%
El Mirage	159.34	100.06	5.10	2.42	266.91	228.26	-38.65	-14.5%
Fountain Hills	306.59	25.00	12.45	4.64	348.67	170.07	-178.59	-51.2%
Gila Bend	793.45	326.24	6.26	0.27	1126.21	617.77	-508.45	-45.1%
GRIC	26.24	148.61	18.30	0.01	193.16	723.70	530.54	274.7%
Gilbert	2114.82	408.82	51.24	1.52	2576.41	4330.25	1753.85	68.1%
Glendale	2112.27	577.41	84.13	7.24	2781.06	3713.21	932.15	33.5%
Goodyear	2377.66	724.22	53.76	0.80	3156.44	5146.07	1989.62	63.0%
Guadalupe	16.92	4.88	12.45	0.01	34.26	45.59	11.33	33.1%
Litchfield Park	152.58	11.17	14.01	0.25	178.01	121.24	-56.77	-31.9%
Mesa	4056.97	978.78	330.10	134.45	5500.30	10280.08	4779.78	86.9%
Paradise Valley	183.07	12.13	73.57	0.72	269.49	13.73	-255.76	-94.9%
Peoria	3271.92	531.45	81.35	8.67	3893.39	5908.79	2015.40	51.8%
Phoenix	14705.76	3803.47	1329.01	36.98	19875.21	19186.52	-688.69	-3.5%
Queen Creek	565.64	157.65	7.04	0.35	730.68	891.26	160.58	22.0%
SRPMIC	31.39	118.66	1.57	3.43	155.06	4591.32	4436.26	2861.1%
Scottsdale	3139.89	594.92	419.12	30.73	4184.65	6250.28	2065.62	49.4%
Surprise	4394.49	732.26	96.97	14.38	5238.10	1627.54	-3610.56	-68.9%
Tempe	1340.14	560.33	220.04	5.43	2125.93	3827.95	1702.01	80.1%
Tolleson	29.57	121.90	7.50	0.00	158.97	579.95	420.97	264.8%
Wickenburg	231.66	70.90	17.95	1.61	322.12	122.16	-199.95	-62.1%
Youngtown	33.38	3.92	7.07	0.12	44.49	17.67	-26.82	-60.3%
TOTAL	\$56,247.42	\$12,735.18	\$3,125.46	\$284.19	\$72,392.24	\$115,442.69	\$43,050.44	59.5%

Source: Applied Economics, 2003.

* Based on 2040 levels, Buildout levels unavailable.

Based on current general and specific land use plans, Buckeye alone would have more than \$32 billion in excess retail potential, or about 78 percent of the total over-supply. While Buckeye may well become the second most populous city in the County, it is unlikely that it could support one-third of all retail development in the County as land use plans indicate. Mesa's net surplus is somewhat understandable given its historic role as a regional retail center. However, that role will likely be reduced somewhat by near-term retail development in Chandler (especially Chandler Fashion Center) and Gilbert, and longer term projects in Queen Creek and northern Pinal County. The indicated surplus for the SRPMIC is a result of plans to develop the 101-Freeway corridor, based on drawing retail demand from surrounding communities including Scottsdale, Phoenix, Tempe and Mesa. This development could pose a challenge to adjacent communities as retailers; including automobile dealerships are drawn to new sites in the SRPMIC.

Among the other communities the results vary, but most are consistent with land use plans and retail patterns exhibited currently. The key pattern includes the mining of retail demand from small-communities at the urban periphery to support retailers in more established, suburban, communities. The implication of continued growth will be to push the "developed" retail base further-and-further out, reducing trade areas for existing centers, and tapping into new demand further from the urban area.

MPA's located along the 101 Freeway and those along the I-10 such as the SRPMIC, GRIC, Buckeye, Tolleson, and Avondale have the most potential for significant net surpluses at build-out. These municipalities hold the largest amount of developable commercial land, and largest potential for new retail development. At build-out, the SRPMIC reservation has the potential retail sales about 30 times higher than resident and visitor demand. Buckeye's apparent potential is almost 6 times total demand, based on existing land use plans. In addition, the potential net surplus of retail sales in the GRIC, Tolleson, and Avondale MPA's could reach two to four times retail demand.

Mesa's retail land use also has sales potential well in excess of demand, resulting in an apparent net surplus of 87 percent of demand by build-out. Goodyear, Glendale, and Tempe also have the potential for net retail surpluses to increase by build-out, which seems especially reasonable for Goodyear and Glendale as they are emerging retail and entertainment hubs. It is unclear whether Tempe will be able to increase its net capture above the positive 72 percent it now enjoys, especially with the move of the Arizona Cardinals and the Fiesta Bowl to Glendale.

Based on their future commercial land use, Chandler and Gilbert have the potential for a net surplus of retail sales of between 50 and 70 percent by build-out, compared to net leakages in 2000. This level of net surplus may reflect over-planning of retail uses, although both communities may be able to support some, if not most of the planned development as they emerge as the new retail hubs of the "outer" southeast Valley. For the same reason, it may be possible for Queen Creek and Peoria to support a potential surplus in retail sales of 20 to 40 percent by build-out, compared to the leakages they currently experience. Results show Cave Creek, Guadalupe and Carefree could also have a significant surplus of planned retail development compared to future demand.

Paradise Valley and Surprise continue to show potential retail leakages, continuing at about present rates. This is understandable for Paradise Valley, but is unexpected in Surprise since it will be the location of so much new residential development between now and build-out. Surprise land use data shows developed retail acres increasing from about 400 currently to

about 1,600 at build-out, which may be insufficient to service future retail demand. El Mirage, Youngtown, Fountain Hills also have the potential for continued leakages, but to a lesser degree than in 2000.

Part IV **Best Planning Practices**

As a component of the MAG Growing Smarter Implementation (RGSi) Project, a series of Best Practices Paper topics have been completed. The topics for the best practice papers were selected by interviewing planning department staff from all MAG member agencies as well as the State Land Department, Pinal County, Casa Grande and Apache Junction. During the interviews, planners were asked what they felt the most important planning issues are within and outside their jurisdictions. This information was then compiled into a survey, which was forwarded to members of the MAG Planners Stakeholders Group, who prioritized their top issues. Some of the topics were later modified in response to specific requests and a vote by attendees of the March 1, 2002 Planners Stakeholders Group meeting.

This component of the Growing Smarter Implementation Project assists member agencies in the following two ways. First, economies will be achieved by sharing some of these planning efforts that each community does in isolation. Second, innovative alternative planning solutions of individual communities will be highlighted for potential use by others. Subsequently, these Best Practices Papers have been provided as resources to all participants in regional planning and are available to the public on MAG's worldwide website. The six papers address:

1. Adequate Public Facilities Ordinances;
2. Affordable Housing;
3. Development Impact Fees;
4. Intergovernmental Planning;
5. Infill Development; and
6. Transit-Oriented Development.

12. Adequate Public Facilities Ordinances

Best Practices Paper #1 addresses Adequate Public Facilities Ordinances (APFO's). APFO's are a powerful tool for local governments in guiding orderly development and planning publicly provided infrastructure and services.

12.1 Intent of APFO's

In principle, land use planning, zoning and public facility plans and ordinances should prevent development in areas that lack adequate levels of urban services and direct development to well-served areas. The key aspect of adequate public facilities ordinances is that local government can delay or withhold the approval of developments in areas where adequate urban services are unavailable. APFO's typically include minimum required levels of service for water, sewer, drainage and streets. They may also specify requirements for schools, fire, police, parks, sidewalks, bicycle paths and transit.

APFO's are based on the concept of concurrency, which means that public facilities must be provided at the same time, or concurrently, as the new development. Concurrency relies on basic regulatory controls already available to local governments: (1) the ability to withhold development permits for timing and sequencing of developments and (2) the ability to budget for anticipated capital improvements.³ A community adopts a LOS standard for each type of facility and applications are denied if the service demands of a project cannot be accommodated at the adopted level of service at the time that the project is completed.⁴

12.2 Constitutional Issues

Usually, an APFO is subject to attack as a regulatory taking.⁵ Under adequate public facilities ordinances, landowners are temporarily denied the use of their land under the police power until utilities can be provided.

In *First English Evangelical Lutheran Church v. County of Los Angeles*,⁶ the California Courts found that the outright prohibition of construction on the property was not a regulatory taking subject to compensation. Fundamental to the court opinion was the balance between public necessity and private deprivation.⁷ The court stated that the preservation of life and health under the ordinance would support the deprivation of all use of a landowner property where aesthetic purposes would not.

This ruling is particularly relevant to adequate public facilities ordinances. For example, aesthetic considerations such as premature urbanization relating to urban form are not the primary justification for adequate public facilities concerns.⁸ The purposes behind APFO's have been described as:

³ White, S. Mark. 1996. *Adequate Public Facilities Ordinances and Transformation Management*. Chicago: Planning Advisory Service, 1.

⁴ Nelson, Arthur C. and James B. Duncan. No date. *Growth Management Principles and Practices*; Planners Press, 95.

⁵ White, *supra* note 1. at 12.

⁶ *First English Evangelical Lutheran Church v. County of Los Angeles*, 210 Cal. App.3d 1353, 258 Cal. Rptr. 893 (Cal. App. 1989), *cert. Denied*, 493 U.S. 1056 (1990)

⁷ *Id.*

[T]he ability of communities to provide public facilities and services essential to individual health, safety, and welfare, and to maintain a balance between development and infrastructure that ensures the overall economic, environmental and psychological well being of a community.⁹

APFO's serve a number of purposes related to public health and safety, e.g., delaying development because there is a lack of sewer service protects groundwater from contamination from septic tanks; delaying development because there is a lack of adequate roads prevents accidents resulting from dangerous levels of congestion; delaying development because there is a lack of fire fighting facilities reduces the chances of death and property damage from fire.¹⁰ Accordingly, cases decided in other states since the Supreme Courts takings trilogy¹¹ indicate that the denial of all use for a reasonable, temporary period of time does not result in a taking under *First English*.

12.3 Implementation

Before a local government can implement adequate facilities ordinances, there must be some authority upon which they can be based.

In Arizona, the 1998 and 2000 Growing Smarter/Plus amendments to state planning statutes provide additional opportunities to include the adequate public facilities ordinance in the growth area element and cost of development element in the general plan. Peoria has recommended an APFO in its Cost of Development Element that was recently adopted by Council and Gilbert planners have considered one as well.

Clearly, in implementing an APFO, it is important to relate growth to infrastructure capacity. Studies should be prepared which address the following three issues:

1. A causal relationship between new growth and the need for additional facilities or capacity to support that growth;
2. The relationship of adequate public infrastructure to basic health, safety and welfare; and
3. The steps being taken by the municipality to ensure that those needs are accommodated, usually through the CIP.¹²

12.4 Local Examples

Queen Creek. Queen Creek adopted a growth area element as a component of the General Plan in May of 1999. The four-tiered system is unique in that it incorporates both character and long-term public facilities phasing elements based on different policies for town center, urban corridor, suburban transition and rural preservation areas. This provides the basis for consistent policy through general plan, rezoning and subdivision processes.

¹⁰ White, *supra* note 1, at 10

¹¹ *First English Evangelical Lutheran Church v. County of Los Angeles*, 482 U.S. 304 (1987); *Lucas v. South Carolina Coastal Council*, ___ U.S. ___, 112 S Ct. 2886, 120 L.Ed.2d 798. (1992); *Dolan v City of Tigard*, ___, U.S. ___, 129 L.Ed2d 304 (1994).

¹² White, *supra* note 1, at 14

LOS standards are based on both national and community-specific data. Public facility elements of the Queen Creek ordinance are water, central sewer, streets, parks/open space and trails, schools and drainage. The schools component required participation and consensus from six different agencies, the town and five school districts. The Town contains five school districts, and a national LOS was adopted to standardize the measure of adequacy. It is likely that the school districts and developers will refine these standards in the future, so that they are community-specific.

Should a development proposal not demonstrate the concurrent availability of required facilities, the ordinance specifies three alternatives; 1) Either the order of development can be deferred until concurrent adequate facilities exist, or 2) the density and/or intensity can be reduced so that existing facilities provide adequate service, or 3) the applicant can agree to provide the required facilities. When the third option is chosen, a legally enforceable development agreement that includes a performance security bond for the facility must accompany the application.

Glendale. The impetus for the Glendale schools APFO was a specific development project. Under state statutes a school district can reserve a site in a new development project for one year. If the district does not have the funds programmed to buy the site during that period, the school loses their reservation authority and the site reverts back to the developer. It is often difficult for a school district to program funds in a 12-month time frame. This can result in schools that are later sited on remnant parcels in locations that are less than ideal.

The Ordinance requires that as a part of a rezoning request to increase density the school district must indicate that there is existing capacity to serve the development or that the developer will make provisions to provide adequate capacity. The specifics determined in negotiations between the developer and the district. The approval can proceed without the statement only if the school district fails to respond.

Buckeye. The Town of Buckeye planning area is more than 400 square miles, largely undeveloped. The Council wanted to ensure that potential rapid development did not outpace capacity in the five school districts that are within incorporated town boundaries. Buckeye planner Donna Stevens reports that there has been overall satisfaction with the ordinance.

Buckeye's APFO is exclusively for concurrent school facilities. It was adopted in October of 2000. The town does not become involved in the means of determining adequacy, but instead relies on the districts and developers to reach agreement on how concurrency will be achieved.

12.5 Findings

- The APFO is one mechanism that can be used to ensure that growth does not erode existing community facility and service standards and undermine long-term community quality. This mechanism should be used to ensure that facility service standards are not compromised during early stages of community maturity. Long-term, facility siting and timing can promote quality neighborhoods and communities that include well-sited parks and schools as focal points.
- Although the adequate public facilities ordinance is relatively new to Arizona, this technique has been used in other parts of the country for over 30 years. During that time it has been supported by an established history of case law. In Arizona, the 1998

and 2000 Growing Smarter/Plus amendments to our state planning law have provided even greater implicit authority at the general plan level to support the use of APFO's.

- The 1998 and 2000 amendments to our state planning requirements have provided a new opportunity to local communities to phase future development and infrastructure patterns and quality in the growth area and costs of development elements of the general plan. These can be used to develop the rationale and principles for concurrency. The adequate public facilities ordinance can then be adopted to implement these elements.
- APFO's streamline the development approval process regarding public facilities. Design and aesthetic considerations maintain the spirit of negotiation that is the hallmark of these approval processes.
- Other methods to improve planning for schools should also be explored. Lengthening the time that a school site could be reserved by a district to longer than the one year period defined by existing statute would not promote concurrency, although it would promote more desirable sites for schools to be integrated with the community fabric.
- The adequate public facilities ordinance should be used as a tool to ensure that a local development approval does not exceed the capacity of regional facilities (such as freeways) that serve it. There are several models for this in other states. Alternatives include regional compacts and state concurrency requirements.

The Queen Creek, Glendale and Buckeye ordinances are models that can be used by other local communities to develop their own ordinances. These differ in approach: The Queen Creek Ordinance covers a comprehensive array of facilities. The Glendale and Buckeye ordinances were developed specifically for schools. Both were developed to facilitate growth while maintaining specific community needs and values.

12.6 Recommendations

In order to add an APFO to the local planner's toolbox and strengthen its legal basis, specific follow-up and preparation is required:

- Communities enhance their planning efforts by taking advantage of new opportunities presented by recent amendments to our State comprehensive plan requirements to establish a sound rationale and principles for concurrent development and infrastructure phasing.
- It is recommended that, where appropriate, an adequate public facilities ordinance be adopted to implement required Growing Smarter/Plus general plan elements.
- Support new legislation be drafted to explicitly state that developers provide school and park sites in relation to the need generated by their development projects.
- Ensure that development does not compromise the ability of local government to serve it at the time that facilities are needed; our state statutes should be amended to specifically include the adequate public facilities ordinance as a tool for concurrency.

- Options to ensure concurrency of local development approvals and the carrying capacity of freeways and other facilities that are of regional significance should be explored. Alternatives might be a regional compact by intergovernmental agreement or explicit enabling legislation that requires local plans to be concurrent with a minimum level of service standards for state facilities.

13. Affordable Housing

Best Practices Paper #2 focused on land use planning mechanisms that can be used by local governments to promote an adequate supply of affordable housing. During interviews, local planning officials cited compelling reasons for selecting affordable housing as the topic for a best practices working paper:

- Increasing awareness of an acute affordable housing crisis throughout Arizona.
- Awareness of an existing spatial imbalance of lower wage jobs to proximate affordable housing. This results in local jobs to housing imbalances and increased in regional traffic congestion.
- Likelihood that economic restructuring, immigration and changing demographics will exacerbate existing affordable housing shortages.
- Concern about the long-term health and safety impacts of segregating economically disadvantaged people from potential employment and educational opportunities.

13.1 The Affordable Housing Problem in Metro Phoenix

The Arizona Housing Commission characterized the problem in its report, *The State of Housing in Arizona*¹³.

"The urgent, overriding message is clear; housing affordability is an impending crisis in Arizona. The large growth of new single-family construction has occurred mainly in the high-income household category. Simultaneously, the number of Arizona households able to afford a mortgage has sharply decreased. Perhaps the most telling data is found in home ownership trends of the last three decades: in 1970 64 % of households could afford to buy the median priced home; as of the second quarter of 1999 the number fell to 43 %".

According to the Arizona Center for Business Research, an Arizona household must currently make at least \$40,200 to afford the median priced resale home and \$46,800 to afford a new home.¹⁴ The 2000 Census indicates that some 46 % of Valley households have incomes of \$40,000 per year or less.¹⁵

A large segment of workers in these households are employed in jobs that would have supported a middle class lifestyle on one income in earlier generations. A recent report by the Phoenix Affordable Housing Commission cites local average starting salaries for several of these professions¹⁶:

¹³ The Arizona Department of Commerce, *The State of Housing in Arizona, 2000*

¹⁴ MAG Regional Housing Assessment, May 2001

¹⁵ U.S. Census Bureau, 2001 <http://factfinder.census.gov>

¹⁶ Data from City of Phoenix Housing Commission Affordable Housing Report, May 2001

<i>Career</i>	<i>Average Starting Salary</i>
Secretary	\$ 18,044
Accountant	\$ 22,724
Teacher	\$ 25,180
Mechanic	\$ 31,220
Firefighter	\$ 33,000
Police Officer	\$ 34,340

The annual salary of a worker earning the current minimum wage (at \$5.50 per hour) is \$11,440. The recent MAG *Regional Affordable Housing Assessment* notes that between 235,000 and 284,000 valley households (from 20 to 24 percent) are experiencing a housing problem. This is defined as paying more than 30 percent of their income for housing or living in substandard or overcrowded housing.

MAG's *Regional Affordable Housing Assessment* identifies a land use component to the problem. The greatest numeric and percentage increases in service sector employment were in outlying areas. The greatest concentrations of service sector job growth in urban areas were in Midtown Phoenix, East Phoenix from Thomas Road to Camelback Road, Central Tempe and Downtown and West Tempe¹⁷. None of these areas experienced growth in affordable housing commensurate with the increase in low wage jobs. It is important to solve this spatial mismatch because it isolates those in need of affordable housing from employment and educational opportunities; and is also an important factor in growing regional traffic congestion.

Most local governments have affordable housing programs that rely on federal funding. In metropolitan Phoenix and elsewhere the scale of these publicly funded housing programs are not close to producing an adequate supply of affordable housing. For example, according to the US Department of Housing and Urban Development (HUD), there are some 20,902 federally assisted housing units in metropolitan Phoenix. Looking at renter households alone, there remain 145,898 households in need.

A trend that will influence the future housing market is an increase in the number of three-generation households. In the U.S. in 1980, only 1.3 million children under the age of 18 lived with one or both parents in their grandparent's homes. By the year 2000, this number had doubled to 2.6 million. This increase is likely due in part to the increase in housing affordability problems and in part to cultural influence of recent Hispanic immigrants, for whom three-generation households are more of a cultural tradition.

Reasons for the crisis in affordable housing in Arizona and elsewhere include the following:

- Lack of Political Will
- Market Imbalance
- Fragmented Local Government Tax Structures
- Land Use and Subdivision Regulations

¹⁷ Id.

13.2 Local Affordable Housing Policy

Local governments operate under an ever-changing umbrella of federal and state policy affecting affordable housing. Federal, State and local policies are reviewed in detail in the original report. Local policy issues related to affordable housing are highlighted.

General Plan Tools

Arizona Growing Smarter and Growing Smarter Plus legislation added housing element requirements to municipal General Plans. For communities of 50,000 and greater, the housing element must contain standards and programs for the elimination of substandard dwelling conditions, for the improvement of housing quality, variety and affordability and for provision of adequate sites for housing. Also required are provisions for the housing needs of all segments of the community regardless of race, color, creed and economic level.

Regardless of the content of the general plan update housing elements, they will be meaningful only when followed up with effective implementation policies and programs.

Fiscal Tools

This section reviews some of the fiscal and regulatory planning tools that may hold the most promise to local governments for promoting affordable housing units. Some of these tools can be used under our existing statutes and others would require new legislation.

Housing Trust Funds

A housing trust fund is a dedicated source of revenue available to help low and moderate income people achieve affordable housing. This could be used as a source of revenue to finance the housing improvement districts that were enabled under Arizona Statutes in 1998. Sources of housing trust funds in other states include linkage payments, tax increment financing, endowments and grants, surplus reserve funds from refinancing municipal bond issues, taxes and fees.

The 2001 MAG Affordable Housing Study proposes that a valley wide housing trust fund could be created if a modest surcharge of one dollar or less were assessed on all residential building permits. Alternately, the report recommends a modest twenty-five cent fee on all residential deeds recorded.

Development Fee Exemptions

Several states have adopted legislation specifically enabling development fee exemptions as an incentive to privately constructed affordable housing units. Exemptions are expressly authorized in Georgia, Florida, New Jersey and Vermont. If Arizona statutes were changed this mechanism could be applied to promote affordable housing. A development fee exemption program must meet the following two criteria.

- Revenue shortfalls caused by the exemptions cannot be passed on to market rate units.
- The exemption must expressly apply to target beneficiaries and developments taking advantage of the waivers should have some enforceable ongoing restrictions to ensure that the units remain affordable.

Linkage Fees

Linkage fee ordinances require developers of commercial, office and industrial uses to build housing or to pay an in lieu fee that is placed in an affordable housing trust fund. The underlying rationale is that when non-residential uses create an affordable housing need by attracting low-wage workers to the community, they should mitigate that need.

Although several components of the Arizona development fee statutes suggest that this might be done in Arizona, local governments may hesitate to adopt such a program because it is not explicitly stated in the laundry list of public services under the development fee statute. Also, given the tax incentives that local governments often use to attract commercial and industrial development there may be a concern that linkage fees would "scare off" developers who would simply go to a nearby community that did not assess linkage fees.

Affordable housing is defined as a public service under Arizona Law in the following language:

It is a valid public purpose of municipalities to assist in providing for the acquisition, construction or rehabilitation of housing and other facilities necessary or incidental to the housing and primarily for the use of those residing in the housing, in areas that are declared by the municipality to be housing development areas, and public monies may be spent for these purposes in these areas. The statute further defines procedures for establishing a housing development area, which include adoption of a resolution that a shortage of housing exists and that assisting in the development of a housing development area is in the interests of the public health safety, morals or welfare of the residents of the municipality. Boundaries of housing development areas cannot exceed 20 % of the total amount of land within a community.¹⁸

In combination, these statutes suggest that development fees could be assessed for affordable housing and/or "other facilities necessary and incidental.

Adequate Public Facilities Ordinances (APFO's)

Adequate public facilities ordinances are a means of controlling the timing of development in direct relationship to a government's ability to service it. This method ties tight regulatory restrictions with a tight, financially feasible capital improvement plan. The level of growth is tied to the capacity of capital facilities in place and those that are programmed in the CIP.

The APFO is frequently cited as a land use control that will raise housing costs¹⁹; however, when designed with affordable housing needs in mind, it can actually be a powerful tool to promote affordable housing.

¹⁸ ARS 9-441.01

¹⁹ Discussed in greater detail in *MAG Growing Smarter Implementation Project Working Paper #1*, February 2001.

Tax Increment Financing (TIF)

Arizona statutes do not provide a mechanism for TIF's, so a change in state legislation would be required to enable their use. If TIF legislation were adopted in Arizona, TIF's could be used as a source of funding for housing incentive districts.

This method is frequently used in other states to encourage redevelopment of blighted areas.²⁰ Under TIF, tax revenues from a "base" valuation existing prior to the redevelopment project continue to be allocated to existing entities. Taxes on increases in value (the tax increment) are used for local government redevelopment activities. These funds are generally used to finance "tax allocation" bonds issued by the redevelopment authority and the value is added back to the tax when the bonds are retired. This method was initially thought inappropriate for financing affordable housing (except in mixed-use projects) because property value increases are necessary to retire the tax allocation bonds and the interest on the bond is higher than that of general revenue bonds.

Zoning and Subdivision Tools

Inclusionary Zoning with Incentives

This refers to local government zoning that either ties development approval to the provision of low and moderate-income housing as a part of a proposed development or requires a percentage of the development to be low to moderate income housing.

Cluster and Tandem Zoning

Innovative cluster site planning techniques can create cost savings by allowing more compact lot sizes and arrangements, more efficient use of infrastructure and greater densities than those allowed under traditional zoning.

Zero Lot Line (ZLL) Development

Zero lot line development can be used to increase density in a single family detached setting.

Fast Tracking Development Approvals for Projects Containing Affordable Housing

Expedited development approvals should be done with the caveat development standards will not be compromised and that it will take additional staff to expedite the process.

Accessory Dwelling Units (ADU's)

ADU's enable communities to expand their current housing stock using existing infrastructure with less land consumption than other residential development forms

13.3 Recommendations

Despite a decade of economic growth there is a crisis in affordable housing in Arizona and within the Phoenix region. Demographic changes in the proportion of elderly and Hispanic households and the continued increase in the number of single parent households indicate that this problem will only get worse. As federal public housing assistance programs have been able to provide only a small percentage of the affordable housing necessary, action toward solving

²⁰ White, Mark S, *Affordable Housing*, American Planning Association, Planning Advisory Service (PAS 441)

this problem must be at the state and local level. The following are steps that local jurisdiction should take to address the issue of affordable housing in their communities.

- 1) Communities should define the affordable housing shortages that are particular to their communities in the housing element of the General Plan. This should be based on a market study to determine the amount of affordable housing that is required and should include analysis of jobs/housing balance and the amount of available land. Also, to promote comprehensive implementation, affordable housing goals and policies should be incorporated into the land use, growth areas, cost of development, neighborhoods and redevelopment elements and (if applicable) infill incentives areas of the General Plan. Also, provisions should be established to include affordable housing in any mixed use and transit oriented development-zoning district.

The General Plan should contain a statement that the proportion of affordable housing will be benchmarked and monitored over time. This will provide an annual gauge of the impact of the General Plan and subsequent implementation policies. (The proposed City of Phoenix Growing Smarter Draft General Plan Update contains this benchmarking and monitoring component.)

- 2) The housing goals and policies defined within the General Plan should be used as a springboard for the development of new implementation policies for affordable housing. Without the timely development of meaningful implementation tools it is unlikely that any community will make progress toward the statutory goal of "equal provision for the housing needs of all segments of the community regardless of race, color, creed and economic level".

Implementation policies to be considered should include:

- Voluntary or mandatory inclusionary zoning ;
 - Fast track development review for projects that contain affordable housing;
 - New forms of higher density housing promoted by new zoning classifications. These should include accessory dwelling units, tandem houses, and zero lot line and cluster development;
 - Public provision of infrastructure support for affordable housing. This could potentially include housing trust funds, development fee waivers, linkage fees, APFO's and/or other new sources;
 - Establishment of Housing Incentives Districts incorporating all of the above options.
- 3) MAG communities should develop consensus on a legislative package to change our state statutes to enable different regional policies to support affordable housing. This might include some level of regional revenue sharing, legislation to allow tax increment financing for affordable housing and specific legislation to enable the use of regional linkage fees.
 - 4) MAG should regularly provide updated jobs housing balance and community housing affordability data to member agencies.

There are significant opportunities for local governments in the MAG Region to develop tools to remove barriers to affordable housing. Given the scale and urgency of the affordable housing problem, progress to improve the supply of affordable is critical to the residents of the region.

14. Development Impact Fees

The topic for Best Practices Paper #3 is a comparative survey and assessment of market effect of development impact fees. Most local governments assess development impact fees to finance capital facilities, and as there are many jurisdictions assessing fees independently it is useful to have a current fee comparison.

Municipalities in Arizona and other states charge more than two-dozen different types of development-related fees. Most fall into three broad categories: (1) planning fees, which cover the administrative costs associated with reviewing requiring planning documents; (2) building permit, plan check, and inspection fees, which cover the costs of reviewing building permit and other site specific permit applications; and, (3) capital facilities fees, or development impact fees, which cover the up-front costs of providing capital infrastructure.

14.1 Authority for Development Impact Fees

The authority for local governments to assess fiscal impact fees is granted at the state level and then tested and refined by federal and state court cases. At the core of these cases are interpretations of constitutional rights to private property. The federal constitution guarantees property owners the right to the use of their property. To deny all use is considered a taking, which the constitution does not allow. However, the courts have held that requiring some dedication by the property owner in the interest of public health and safety is permissible.

The two most specifically applicable of the Supreme Court Rulings are *Nollan v California Coastal Commission*, 483 U.S. 825 (1987) and *Dolan v. City of Tigard*, 114 S. Ct.2308 (1994). These established two overriding tenants for development impact fees; the rational nexus (that there must be a reasonable connection between the development and the benefit for which the fee is assessed), and rough proportionality (that the fee charged must be related both in nature and in extent to the burden of use generated by the development).

Arizona Statutes

In Arizona, state statutes specifically enabled municipal development impact fees in 1892. County fees were enabled only in 2000 as a component of the Growing Smarter legislation. This section contains an analysis of the municipal and county statutes. Excerpts that contain language from current statutes that rule how municipal and county fees can be assessed are attached as "Appendix B". (The complete statutes can be found on the Arizona State Legislature website at <http://www.azleg.state.az.us/ars/ars.htm>.)

Cities and Towns

Arizona municipal development impact fee statutes enable municipalities to assess development impact fees for a legitimate public purpose. They establish procedures that follow the constitutional requirements for development impact fees; that the fees are assessed for facilities that benefit the development; that money (including interest earned) be used only for the specified purposes; and that there is a reasonable relationship between the fee amount and the development. The statutes also include a statement that fees must be administered in a "non-discriminatory manner", which means that fees cannot be waived for some developments and not others. Local governments do have the ability to fund fees on behalf of a development from some other funding source, as long as this source does not include other development impact fees.

14.2 Comparative Development Impact Fees

Impact Fees in Metro Phoenix

The comparative fee research was conducted from June 2001 to January 2002. All metropolitan Phoenix jurisdictions were e-mailed a survey. Survey questions were based on questions posed during the planning department interviews at the inception of the RGSi Project.

Most of the local governments in this region levy development impact fees. The revenues are used to fund a variety of local facilities. Municipal fee levels vary widely in the region. For example, a single family home is assessed a fee ranging from \$12,680 to \$0 per unit, depending on the jurisdiction, building envelope and house size. This is largely due to varying levels of infrastructure already in place, variation in financing mechanisms used for different facilities and variations in level of service (LOS) standards.

The specific impact fees that different communities charge for single-family, multifamily, retail, office and industrial development are shown in the series of tables starting on the following page. On average, Maricopa County municipalities have development impact fees of \$5,538 per 1,000 square feet for single-family residential, \$3,618 for multifamily residential, \$3,338 for retail, \$2,038 for office and \$1,469 for industrial.

It would be a mistake to consider these tables comparing development impact fees as a comparison of the relative building costs in different jurisdictions.

- Infrastructure is required to serve new development. If development impact fees do not pay the costs, they are paid for in some other way. If the fiscal impacts of new development are not paid at the time of approval (as in development exactions or fees) then they are either paid at a later stage of the development cycle (as in taxes) or infrastructure exceeds capacity and community standards and quality of life are compromised.
- Communities use different mechanisms to fund infrastructure. These can include various combinations of funding, including bonds, exactions, community facilities districts, exactions, excise taxes.
- There is a tendency for developed areas to have lower fees and higher land costs. Conversely, there is a tendency for newly developing areas to have higher fees and lower land costs. (A notable class of exceptions is in some redevelopment areas. An example is in Tempe, where water and wastewater facilities are being expanded in developed areas to accommodate new industrial development.

Single Family Development Impact Fees in Maricopa County Municipalities

	Library	Parks Open Space	Sanitation	Water Systems Dev.	Water Resource Dev.	Water ODF	Reclaimed Water Dev.	Waste Water Trunk	Waste Water Dev.	Waste Water ODF	Trans.	Police	Fire & EMS	General	City Total
Apache Junction	\$199	\$366	\$0	\$0	\$0	0	\$0	\$0	\$0	\$0	\$270	\$118		\$53	\$1,006
Avondale	\$300	\$300	\$200	\$750	\$750	\$450	\$0	\$300	\$1,900	\$300	\$400	\$145	\$250	\$500	\$6,545
Buckeye	\$0	\$0	\$0	\$1,331	\$0	\$0	\$0	\$0	\$3,252	\$0	\$0	\$0	\$379	\$0	\$4,962
Carefree (7)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	N/A
Cave Creek	\$0	\$300	\$0	\$0	\$0	\$0	\$0	\$0	\$1,635	\$0	\$250	\$0	\$0	\$760	\$2,945
Chandler (13)	\$68	\$680	\$0	\$1,479	\$673	\$600	\$878	\$0	\$1,168	\$600	\$1,537	\$159	\$105	\$231	\$8,178
Fountain Hills	\$0	\$2,129	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$638	\$71	\$0	\$437	\$3,275
Gilbert	\$0	\$945	\$0	\$2,176	\$300	\$0	\$0	\$0	\$0	\$2,452	\$148	\$362	\$206	\$357	\$6,946
Glendale	\$452	\$1,094	\$264	\$1,367	\$0	\$1,140	\$0	\$0	\$2,003	\$1,238	\$542	\$289	\$311	\$660	\$9,360
Goodyear	\$0	\$57	\$150	\$1,200	\$1,755	\$0	\$0	\$0	\$1,134	\$0	\$148	\$123	\$211	\$118	\$4,896
Litchfield Park (6)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Mesa	\$378	\$696	100*	\$907	\$0	\$0	\$0	\$0	\$1,059	\$0	\$0	\$226	\$145	\$128	\$3,539
Peoria North	\$294	\$1,361	\$0	\$3,237	\$558	\$227	\$0	\$0	\$1,996	\$0	\$4,028	\$186	\$275	\$518	\$12,680
Peoria South	\$294	\$1,361	\$0	\$3,237	\$558	\$227	\$0	\$0	\$1,996	\$0	\$356	\$186	\$275	\$518	\$9,008
Phoenix High (N. Black Canyon)	\$342	\$2,872	\$134	\$2,647	\$633	\$600	\$0	\$0	\$1,308	\$600	\$2,700	\$88	\$160	\$76	\$12,160
Phoenix Low (Ahwatukee)	\$314	\$882	\$0	\$204	\$426	\$600	\$0	\$0	\$87	\$600	\$0	\$100	\$161	\$96	\$3,470
Queen Creek	\$616	\$3,229	\$0	\$0	\$0	\$0	\$0	\$0	\$2,679	\$0	\$0	\$185	see (9)	\$600	\$7,309
Scottsdale South (17)	\$0	\$0	\$0	\$293	\$484	\$0	\$0	\$0	\$1,123	\$0	\$0	\$0	see (9)	\$0	\$1,900
Scottsdale North (17)	\$0	\$0	\$0	\$2,214	\$580	\$0	\$0	\$0	\$2,668	\$0	\$0	\$0	see (9)	\$0	\$5,462
Surprise (12)	\$1,356	*	\$524	\$1,770	\$824	\$0	\$0	\$0	\$1,916	\$0	\$0	\$0	see (16)	\$878	\$7,268
Tempe	\$0	0	\$0	\$0	\$0	\$875	\$0	\$0	\$930	\$0	\$0	\$0	see (16)	470	\$2,275
Tolleson	\$0	\$0	\$0	\$900	\$0	\$0	\$0	\$0	\$574	\$0	\$644	\$287	\$347	\$362	\$3,114

Assumptions

- (1) Where water and wastewater fees are based on meter size, a .75 inch meter has been assumed for single family
 - (2) Multi family per unit fees are based on a 200 unit building with 9 2 inch meters.
 - (3) Avondale, Goodyear and Litchfield Park assure school adequacy through the Southwest Cities, Schools and Developers Partnership.
 - (4) Queen Creek and Buckeye include schools in adequate public facilities ordinance.
 - (5) In Carefree, Apache Junction and Fountain Hills water and/or wastewater services are provided by a private companies.
 - (6) In Litchfield Park, infrastructure is negotiated by development agreement.
 - (7) Carefree does not assess infrastructure fees. Water and Wastewater service are privately contracted.
 - (8) Tempe assesses only water and wastewater occupational development fees.
 - (9) In Queen Creek and Scottsdale fire and EMS service are privately contracted.
 - (10) Phoenix equipment repair fees have been placed in the general government category.
 - (11) Surprise combines - police, fire and EMS into one fee, Waste Water is for the North Zone
 - (12) Surprise combines parks, recreation and library in a single fee, which has been listed under "library." Similarly "public works" category is under "sanitation."
 - (13) Chandler - Transportation and Water Resource are area specific.
 - (14) Peoria - Waste water and Transportation are area specific (average used in this table). Water resource fee in off project only.
 - (15) Phoenix - See page 2 for breakout by area & attached detail pages for Phoenix. Maps to be provided with full report.
 - (16) These jurisdictions contract for fire and EMS service.
 - (17) The City of Scottsdale bases residential fees on building envelope size for single family and square footage per unit for multifamily.
- The numbers depict a density of 5 DU/AC single-family and 1,500 SG for multi-family. (For more detail please see attachment.)

Multifamily Development Impact Fees in Maricopa County Municipalities

	Library	Parks Open Space	Sanitation	Water Systems Dev.	Water Resource Dev.	Water ODF	Reclaimed Water Dev.	Waste Water Trunk	Waste Water Dev.	Waste Water ODF	Trans.	Police	Fire & EMS	General	City Total
Apache Junction	\$191	\$352	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$183	\$114		\$51	\$791
Avondale	\$253	\$300	\$300	\$750	\$750	\$40	\$0	\$300	\$451	\$300	\$276	\$123	\$211	\$423	\$4,477
Buckeye	\$0	\$0	\$0	\$317	\$0	\$0	\$0	\$0	\$776	\$0	\$0	\$0	\$344	\$0	\$1,437
Carefree (7)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	N/A
Cave Creek	\$0	\$300	\$0	\$0	\$0	\$0	\$0	\$0	\$1,635	\$0	\$250	\$0	\$0	\$760	\$2,945
Chandler (13)	\$57	\$391	\$0	\$1,018	\$424	\$360	\$651	\$0	\$865	\$360	\$1,010	\$159	\$105	\$231	\$5,631
Fountain Hills	\$0	\$2,129	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$341	\$71	\$0	\$437	\$2,978
Gilbert	\$0	\$813	\$0	\$1,260	\$188	\$0	\$0	\$0	\$0	\$1,868	\$105	\$362	\$206	\$357	\$5,159
Glendale	\$327	\$793	\$49	\$524	\$0	\$608	\$0	\$0	\$1,370	pr	\$329	\$209	\$225	\$478	\$4,912
Goodyear	\$0	\$52	\$138	\$1,200	\$1,755	\$0	\$0	\$0	\$1,134	\$0	\$102	\$113	\$211	\$109	\$4,814
Litchfield Park (6)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Mesa	\$268	\$494	25*	\$644	\$0	\$0	\$0	\$0	\$752	\$0	\$0	\$160	\$106	\$91	\$2,515
Peoria North	\$194	\$859	\$0				\$0	\$0		\$0	\$3,195	\$118	\$174	\$328	\$4,868
Peoria South	\$194	\$859	\$0				\$0	\$0		\$0	\$1,253	\$118	\$174	\$328	\$2,926
Phoenix High (N. Black Canyon)	\$135	\$1,044	\$0	\$0	\$380	\$360	\$0	\$0	\$534	\$360	\$1,863	\$38	\$126	\$33	\$4,873
Phoenix Low (Ahwatukee)	\$142	\$327	\$0	\$0	\$256	\$360	\$0	\$0	\$0	\$360	\$0	\$43	\$126	\$41	\$1,655
Queen Creek	\$607	\$3,182	\$0	\$0	\$0	\$0	\$0	\$0	\$636	\$0	\$0	\$182	see (9)	\$591	\$5,198
Scottsdale South (17)	\$0	\$0	\$0	\$2,214	\$580	\$0	\$0	\$0	\$2,668	\$0	\$0	\$0	see (9)	\$0	\$5,462
Scottsdale North (17)	\$1,356	*	\$524	\$1,770	\$824	\$0	\$0	\$0	\$1,916	\$0	\$0	\$0	see (16)	\$878	\$7,268
Surprise (12)	\$956	*	\$369	\$196	\$824	\$0	\$0	\$0	\$1,593	\$0	\$0	\$0	see (16)	\$249	\$4,187
Tempe	\$0	\$0	\$0	\$0	\$0	\$875	\$0	\$0	\$930	\$0	\$0	\$0	see (16)	\$470	\$2,275
Tolleson	\$0	\$0	\$0	\$137	\$0	\$0	\$0	\$0	\$132	\$0	\$446	\$255	\$307	\$321	\$1,599

Assumptions

- (1) Where water and wastewater fees are based on meter size, a .75 inch meter has been assumed for single family
 - (2) Multi family per unit fees are based on a 200 unit building with 9 2 inch meters.
 - (3) Avondale, Goodyear and Litchfield Park assure school adequacy through the Southwest Cities, Schools and Developers Partnership.
 - (4) Queen Creek and Buckeye include schools in adequate public facilities ordinance.
 - (5) In Carefree, Apache Junction and Fountain Hills water and/or wastewater services are provided by a private companies.
 - (6) In Litchfield Park, infrastructure is negotiated by development agreement.
 - (7) Carefree does not assess infrastructure fees. Water and Wastewater service are privately contracted.
 - (8) Tempe assesses only water and wastewater occupational development fees.
 - (9) In Queen Creek and Scottsdale fire and EMS service are privately contracted.
 - (10) Phoenix equipment repair fees have been placed in the general government category.
 - (11) Surprise combines - police, fire and EMS into one fee, Waste Water is for the North Zone
 - (12) Surprise combines parks, recreation and library in a single fee, which has been listed under "library." Similarly "public works" category is under "sanitation."
 - (13) Chandler - Transportation and Water Resource are area specific.
 - (14) Peoria - Waste water and Transportation are area specific (average used in this table). Water resource fee in off project only.
 - (15) Phoenix - See page 2 for breakout by area & attached detail pages for Phoenix. Maps to be provided with full report.
 - (16) These jurisdictions contract for fire and EMS service.
 - (17) The City of Scottsdale bases residential fees on building envelope size for single family and square footage per unit for multifamily.
- The numbers depict a density of 5 DU/AC single-family and 1,500 SG for multi-family. (For more detail please see attachment.)

Retail Development Impact Fees In Maricopa County Municipalities

	Library	Open Space & Parks	Sanita- tion	Water Systems Dev.	Water Resource Dev. (11)	Water ODF	Reclaimed Water Dev.	Waste Water Dev. (7, 10)	Waste Water ODF	Streets	Police	Fire & EMS (3)	General Govern- ment (1)	TOTAL
Apache Junction (5)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$846	\$364	\$0	\$164	\$1,374
Avondale	\$0	\$0	\$85	\$88	\$225	\$0	\$0	\$378	\$0	\$1,879	\$424	\$189	\$237	\$3,505
Buckeye	\$0	\$0	\$0	\$0	\$0	\$191	\$0	\$0	\$464	\$0	\$0	\$224	\$0	\$879
Carefree (5)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	N/A
Cave Creek	\$0	\$300	\$0	\$0	\$0	\$0	\$0	\$1,635	\$0	\$250	\$0	\$0	\$760	\$2,945
Chandler	\$0	\$0	\$0	\$315	see note 12	\$0	\$187	\$248	\$0	\$3,880	\$50	\$30	\$70	\$4,780
Fountain Hills (5)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,020	\$50	\$0	\$280	\$2,350
Gilbert	\$0	\$0	\$0	\$309	\$41	\$309	\$0	\$348	\$0	550	\$190	\$110	\$190	\$2,049
Gilbert Offset (8)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$275	\$95	\$55	\$0	\$425
Glendale	\$0	\$0	\$66	\$152	\$0	\$0	\$520	\$165	\$819	\$1,935	\$634	\$183	\$528	\$5,002
Goodyear	\$0	\$0	\$125	0	\$250	\$240	\$0		\$227	\$418	\$408	\$348	\$94	\$2,110
Mesa	\$0	\$0	\$0	\$0	\$0	\$193	\$0	\$0	\$226	\$0	\$660	\$423	\$0	\$1,502
Peoria North	\$0	\$0	\$0		\$79	\$13	\$0	\$274		\$16,645	\$999	\$221	\$417	\$18,648
Peoria South	\$0	\$0	\$0	\$445	67	\$13	\$0	\$508		\$1,472	\$999	\$221	\$417	\$4,142
Phoenix High	\$17	\$304	\$51		\$36	\$45	\$0	\$36	\$45	\$5,508	\$55	\$73	\$78	\$5,927
Phoenix Low	\$20	\$26	\$34	\$0	\$0	\$45	\$0	\$45	\$45	\$0	\$62	\$74	\$98	\$403
Queen Creek (5)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$75	\$0	\$442	\$517
Scottsdale Average	\$0	\$0	\$0	See note 9	See note 9	\$0	\$0	See note 9	\$0	\$0	\$0	\$0	\$0	\$5,549
Surprise	\$0	\$0	\$0	\$252	\$117	\$0	\$0	\$305(5)	\$0	\$0	*	\$762 (3)	\$660	\$1,029
Tempe	\$0	\$0	\$0	\$169	\$0	\$110	\$0	\$184	\$0	\$0	\$0	\$0	\$0	\$462
Tolleson	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,182	\$492	\$216	\$272	\$3,162

(1) Where water or wastewater system fees are based on meter size, a 3 inch turbine meter in a 75,000 square foot building has been assumed.

To get the cost per 1,000 square feet, the cost of the meter is divided by 75.

(2) Some communities define separate categories for public works and general government. There is some overlap in the descriptions for these, so they have been combined under "General Government"

(3) The Town of Surprise combines the fee for police and fire protection. Therefore, the police fee is included under "Fire and EMS".

(4) Carefree does not currently charge fiscal impact fees, though they are being considered. Water and wastewater are privately contracted.

(5) Surprise sewer fees are assessed in the south zone only.

(6) Water and wastewater fees are privately contracted in Carefree, Apache Junction, Queen Creek and Fountain Hills.

(7) Chandler Wastewater Trunk lines have been included in the wastewater system development fee.

(8) The Town of Gilbert pays an economic development offset for some nonresidential fees.

(9) Scottsdale assesses only water and wasater and wastewater fees. These are based on water usage (see attached table for detailed breakout.

(10) Peoria wastewater fees are calculated based on the specifics of the facility .

The unit cost can be calculated in relation to a per unit fee of \$1966 per 300 gallons per day.

(11) Peoria water resource fees are assessed for "off project" areas only.

Office Development Impact Fees In Maricopa County Municipalities

	Library	Open Space & Parks	Sanita- tion	Water Systems Dev.	Water Resource Dev. (11)	Water ODF	Reclaimed Water Dev.	Waste Water Dev. (7, 10)	Waste Water ODF	Streets	Police	Fire & EMS (3)	General Govern- ment (1)	TOTAL
Apache Junction (5)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$469	\$230	\$0	\$103	\$802
Avondale	\$0	\$0	\$85	\$88	\$225	\$0	\$0	\$378	\$0	\$732	\$164	\$270	\$339	\$2,281
Buckeye	\$0	\$0	\$0	\$0	\$0	\$191	\$0	\$0	\$464	\$0	\$0	\$390	\$0	\$1,045
Carefree (5)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cave Creek	\$0	\$300	\$0	\$0	\$0	\$0	\$0	\$1,635	\$0	\$250	\$0	\$0	\$760	\$2,945
Chandler	\$0	\$0	\$0	\$315	see note 12	\$0	\$187	\$248	\$0	\$2,260	\$50	\$30	\$70	\$3,160
Fountain Hills (5)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$580	\$50	\$0	\$280	\$910
Gilbert	\$0	\$0	\$0	\$309	\$41	\$309	\$0	\$348	\$0	\$200	\$190	\$110	\$190	\$1,699
Gilbert Offset (8)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$150	\$143	\$83	\$0	\$375
Glendale	\$0	\$0	\$100	\$152	\$0	\$0	\$371	\$165	\$588	\$1,440	\$472	\$278	\$801	\$4,367
Goodyear	\$0	\$0	\$178	0	\$250	\$240	\$0		\$227	\$168	\$164	\$567	\$135	\$1,929
Mesa	\$0	\$0	\$0	\$0	\$0	\$193	\$0	\$0	\$226	\$0	\$341	\$219	\$0	\$979
Peoria North	\$0	\$0	\$0	\$445	67	\$13	\$0	See note 10		\$5,586	\$335	\$316	\$595	\$7,357
Peoria South	\$0	\$0	\$0	\$445	67	\$13	\$0	See note 10		\$494	\$335	\$316	\$595	\$2,265
Phoenix High	\$32	\$432	\$68		\$52	\$60	\$0	\$52	\$60	\$4,266	\$53	\$64	\$64	\$4,739
Phoenix Low	\$36	\$54	\$45	\$4	\$0	\$60	\$0	\$60	\$60	\$0	\$60	\$64	\$82	\$435
Queen Creek (5)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17	\$0	\$632	\$649
Scottsdale Average	\$0	\$0	\$0	See note 9	See note 9	\$0	\$0	See note 9	\$0	\$0	\$0	\$0	\$0	\$3,329
Surprise	\$0	\$0	\$0	\$252	\$117	\$0	\$0	\$305(5)	\$0	\$0	*	\$839 (3)	\$1,062	\$1,431
Tempe	\$0	\$0	\$0	\$169	\$0	\$110	\$0	\$184	\$0	\$0	\$0	\$0	\$0	\$463
Tolleson	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$732	\$164	\$270	\$339	\$1,505

(1) Where water or wastewater system fees are based on meter size, a 3 inch turbine meter in a 75,000 square foot building has been assumed.

To get the cost per 1,000 square feet, the cost of the meter is divided by 75.

(2) Some communities define separate categories for public works and general government. There is some overlap in the descriptions for these, so they have been combined under "General Government"

(3) The Town of Surprise combines the fee for police and fire protection. Therefore, the police fee is included under "Fire and EMS".

(4) Carefree does not currently charge fiscal impact fees, though they are being considered. Water and wastewater are privately contracted.

(5) Surprise sewer fees are assessed in the south zone only.

(6) Water and wastewater fees are privately contracted in Carefree, Apache Junction, Queen Creek and Fountain Hills.

(7) Chandler Wastewater Trunk lines have been included in the wastewater system development fee.

(8) The Town of Gilbert pays an economic development offset for some nonresidential fees.

(9) Scottsdale assesses only water and wastewater fees. These are based on the amount of water used. (See Scottsdale Table for breakout.)

(10) Peoria wastewater fees are calculated ater and wastewater fees. These are based on water usage (see attached table for detailed breakout.

The unit cost can be calculated in relation to a per unit fee of \$1966 per 300 gallons per day.

(11) Peoria water resource fees are assessed for "off project" areas only.

Industrial Development Impact Fees In Maricopa County Municipalities

	Library	Open Space & Parks	Sanita- tion	Water Systems Dev.	Water Resource Dev. (11)	Water ODF	Reclaimed Water Dev.	Waste Water Dev. (7, 10)	Waste Water ODF	Streets	Police	Fire & EMS (3)	General Govern- ment (1)	TOTAL
Apache Junction (5)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$197	\$130	\$0	\$58	\$385
Avondale	\$0	\$0	\$85	\$88	\$225	\$0	\$0	\$378	\$0	\$384	\$86	\$174	\$220	\$1,640
Buckeye	\$0	\$0	\$0	\$0	\$0	\$191	\$0	\$0	\$464	\$0	\$0	\$271	\$0	\$926
Carefree (5)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	N/A
Cave Creek	\$0	\$300	\$0	\$0	\$0	\$0	\$0	\$1,635	\$0	\$250	\$0	\$0	\$760	\$2,945
Chandler	\$0	\$0	\$0	\$315	see note 12	\$0	\$187	\$248	\$0	\$1,630	\$50	\$30	\$70	\$2,530
Fountain Hills (5)	\$0	\$0	\$0	\$0	\$0	0	\$0	\$0	0	\$580	\$50	\$0	\$280	\$910
Gilbert	\$0	\$0	\$0	\$309	\$41	\$309	\$0	\$348	\$0	\$140	\$190	\$110	\$190	\$1,639
Gilbert Offset (8)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$105	\$47	\$83	\$0	\$235
Glendale	\$0	\$0	\$47	\$152	\$0	\$0	\$323	\$165	\$514	\$398	\$130	\$133	\$385	\$2,247
Goodyear	\$0	\$0	\$91	0	\$250	\$240	\$0		\$227	\$48	\$107	\$21	\$68	\$1,052
Mesa	\$0	\$0	\$0	\$0	\$0	\$193	\$0	\$0	\$226	\$0	\$228	\$146	\$0	\$793
Peoria North	\$0	\$0	\$0	\$445	67	\$13	\$0	See note 10		\$2,934	\$176	\$204	\$385	\$4,224
Peoria South	\$0	\$0	\$0	\$445	67	\$13	\$0	See note 10		\$259	\$176	\$204	\$385	\$1,549
Phoenix High	\$16	\$248	\$148		\$0	\$216	\$0	\$6	\$216	\$552	\$57	\$87	\$28	\$1,310
Phoenix Low	\$18	\$29	\$99	\$0	\$0	\$216	\$0	\$216	\$216	\$0	\$64	\$88	\$36	\$935
Queen Creek (5)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$20	\$0	\$322	\$342
Scottsdale Average	\$0	\$0	\$0	See note 9	See note 9	\$0	\$0	See note 9	\$0	\$0	\$0	\$0	\$0	\$3,329
Surprise	\$0	\$0	\$0	\$252	\$117	\$0	\$0	\$305(5)	\$0	\$0	*	\$483 (3)	\$687	\$1,056
Tempe	\$0	\$0	\$0	\$169	\$0	\$110	\$0	\$184	\$0	\$0	\$0	\$0	\$0	\$462
Tolleson	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$384	\$86	\$174	\$220	\$864

- (1) Where water or wastewater system fees are based on meter size, a 3 inch turbine meter in a 75,000 square foot building has been assumed. To get the cost per 1,000 square feet, the cost of the meter is divided by 75.
- (2) Some communities define separate categories for public works and general government. There is some overlap in the descriptions for these, so they have been combined under "General Government"
- (3) The Town of Surprise combines the fee for police and fire protection. Therefore, the police fee is included under "Fire and EMS".
- (4) Carefree does not currently charge fiscal impact fees, though they are being considered. Water and wastewater are privately contracted.
- (5) Surprise sewer fees are assessed in the south zone only.
- (6) Water and wastewater fees are privately contracted in Carefree, Apache Junction, Queen Creek and Fountain Hills.
- (7) Chandler Wastewater Trunk lines have been included in the wastewater system development fee.
- (8) The Town of Gilbert pays an economic development offset for some nonresidential fees.
- (9) Scottsdale assesses only water and wastewater fees. These are based on the amount of water used. (See Scottsdale Table for breakout.)
- (10) Peoria wastewater fees are calculated ater and wastewater fees. These are based on water usage (see attached table for detailed breakout. The unit cost can be calculated in relation to a per unit fee of \$1966 per 300 gallons per day.
- (11) Peoria water resource fees are assessed for "off project" areas only.

Some communities prefer to negotiate during the development approval process for developer funded or provided infrastructure.¹ These are put in place by development agreement. (A development agreement recently negotiated in Goodyear included both capital facilities and early service costs.) These facilities may or may not be included in a development impact fee program. When they are included, offsets are provided up to the amount that the fee that would have been. These offsets are not possible for costs in excess of the development impact fee or for amenities that are not included in the development impact fee program.

As required by statute, all fee programs that were studied for this report provide some offset for the proportion of facilities included in the development impact fee program that are be paid for by property taxes, municipal improvement bonds, CFD's, and/or excise taxes.

Metro Phoenix Impact Fees Compared to Other Regions

Generally, metro Phoenix municipalities have higher impact fees for residential water, wastewater, parks and public safety (Table 14-1). Surprisingly, metro Phoenix municipalities have lower average impact fees for transportation than the national average – nearly \$600 lower per 1,000 square feet.

Regarding nonresidential impact fees, MAG region municipalities, have much lower average impact fees for each category – retail, office, and industrial – than the national sample average. The sole category for which metro Phoenix is higher is for parks.

Table 14-1

National and Metro Phoenix Average Impact Fees, 2000

	Single Family (per unit)		Retail (per 1000 sq. ft.)		Office (per 1000 sq. ft.)		Industrial (per 1000 sq. ft.)	
	National Sample	Metro Phoenix	National Sample	Metro Phoenix	National Sample	Metro Phoenix	National Sample	Metro Phoenix
Water	\$ 2,189	\$ 3,099	\$ 765	\$ 228	\$ 961	\$ 241	\$ 487	\$ 251
Wastewater	\$ 1,956	\$ 2,892	\$ 825	\$ 815	\$ 809	\$ 304	\$ 522	\$ 321
Road	\$ 1,535	\$ 981	\$ 3,116	\$ 1,803	\$ 1,792	\$ 825	\$ 881	\$ 374
Park	\$ 1,218	\$ 1,434	\$ -	\$ 30	\$ -	\$ 37	\$ -	\$ 27
Public Safety	\$ 493	\$ 538	\$ 190	\$ 396	\$ 155	\$ 287	\$ 68	\$ 166
Schools	\$ 2,750	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ 10,141	\$ 8,943	\$ 4,896	\$ 3,272	\$ 3,717	\$ 1,694	\$ 1,958	\$ 1,139
Phoenix Index		0.88		0.67		0.46		0.58

Sources: National Average Impact Fees - Dr. James C. Nicholas, Holland Law Center, University of Florida at Gainesville, 2000.
Metro Phoenix Impact Fees - Maricopa Association of Governments, January 2002
Average New Home Size in Phoenix - Center for Business Research, Arizona State University, Housing in Metropolitan Phoenix, August 2000

¹ These negotiations are important to many communities, and were frequently cited as a reason to forego the use of an adequate public facilities ordinance. In jurisdictions that have more stringent design standards, such as Queen Creek, planners report that this same spirit of negotiation can be achieved over aesthetic standards.

The second study is based on unpublished data from the State of Maryland, which collected year 2000 development impact fee information for 95 municipalities and counties across the United States². Including the metro Phoenix municipalities surveyed in this report, the national average for single-family residential was \$3,654 per 1,000 square feet. The highest impact fees are in San Diego, California (\$17,247), and the lowest are in Franklin, Tennessee (\$213). The Phoenix average, by comparison, is \$5,558 – 58% higher than the national sample. The Phoenix high impact fee for single-family residential is Peoria North (\$12,680), with several municipalities charging no impact fees.

14.3 Regional Development Impact Fees

The states of Maryland, Oregon and Washington all have a mechanism for regional impact fees that are part of their state growth management legislation. Generally, the fees are part of the State's state planning goals. In Oregon and Washington, regional impact fees are mandatory – they must be used. In Maryland, they are incentive-based – other state funds are allocated to jurisdictions depending on how closely they meet the state planning goals, including regional impact fees. However, municipalities have the option of instituting regional fees or not. The incentives-based model was proposed in an early draft of the Growing Smarter/Plus legislation, would have used incentives to develop and implement state planning goals. The language that would have enabled this was subsequently removed during the public participation and adoption processes.

Arizona's development impact fee legislation does not specifically authorize regional fees, which would be possible only if the legislation were changed or if local communities entered into a compact to use their existing authority to impose and collect regional fees as a condition of development approval. The compact could be implemented through a regional agreement to be approved unanimously local jurisdictions (including the County). It could establish uniform application of the fee region-wide. It also could designate the responsibility for program management and coordination to a single government agency.

14.4 Joint Impact Fees for Locally Provided Infrastructure

Some of the planning directors interviewed at the inception of the RGSi project spoke of traffic congestion generated by developments that were approved by neighboring communities. In such a circumstance, the developers and the approving jurisdiction are defined as "free riders". This was cited as the most significant problem for one small community that does not currently have a means to fund improvements, and will soon experience severe congestion from an adjacent community.

Local governments could elect to use their existing powers to assess fees for developments that impact neighboring jurisdictions. There are examples of intergovernmental agreements that mitigate this kind of inequity in the case of sales tax.³ It could also be mitigated through development impact fees. Jurisdictions could plan and finance one or several different kinds of facilities jointly through locally collected fiscal impact fees by establishing a joint area of benefit. This could be done by two or more jurisdictions. It would be essential to provide facilities in a timely manner.

² California, Colorado, Florida, Georgia, Illinois, Iowa, Kentucky, Maryland, Montana, North Carolina, New Mexico, Nevada, Oregon, South Carolina, and Tennessee.

³ The Chandler-Tempe and Queen Creek-Gilbert sales tax sharing agreements are discussed in a subsequent RGSi paper.

Communities that are receiving "windfall" benefits may be reluctant to enter into such an agreement. Planners, who have as a profession taken on the ethical challenge of being stewards of the public health and safety should advise their decision makers of the mutual benefits of a healthy infrastructure both within the community and in adjacent communities.

14.5 Market Effect of Impact Fees and Alternatives for Infrastructure Financing

Development impact fees are a real cost that has an economic impact on communities that use them. This section reviews the economic impact of development impact fees and other infrastructure funding tools that are possible alternatives.

Economic Impact of Development Impact Fees⁴

The economic impact of development impact fees is rarely considered by impact fee studies, which usually compute fees directly from the costs of providing infrastructure alone. In 1990, Coopers & Lybrand prepared such a report for the City of San Diego. Though it includes out-of-date cost information, the conceptual discussion of the marketplace impacts of development impact fees is important for municipalities to understand.

From an economic perspective, the major problems with development impact fees are that they are paid in their entirety on a per-building basis, and that they are paid upon pulling a building permit. *This means that their price impact is immediate, rather than on a term basis.*

- The effect on consumers of large buildings (e.g., industrial, office, and retail businesses) is that total dollar costs are high. It is not inconceivable for development impact fees to range from \$1-2 million for the largest nonresidential buildings. Thus, development impact fees have an effect on *economic development*.
- The effect on buyers or renters of residential buildings is limited to that segment of the market that already pays a disproportionately high share of their income for housing. These are the consumers with average or below average income. Thus, development impact fees have an effect on *housing affordability*. This is particularly a problem in metro Phoenix, as 64% of the region's occupations were paid below the average salary of \$30,000.

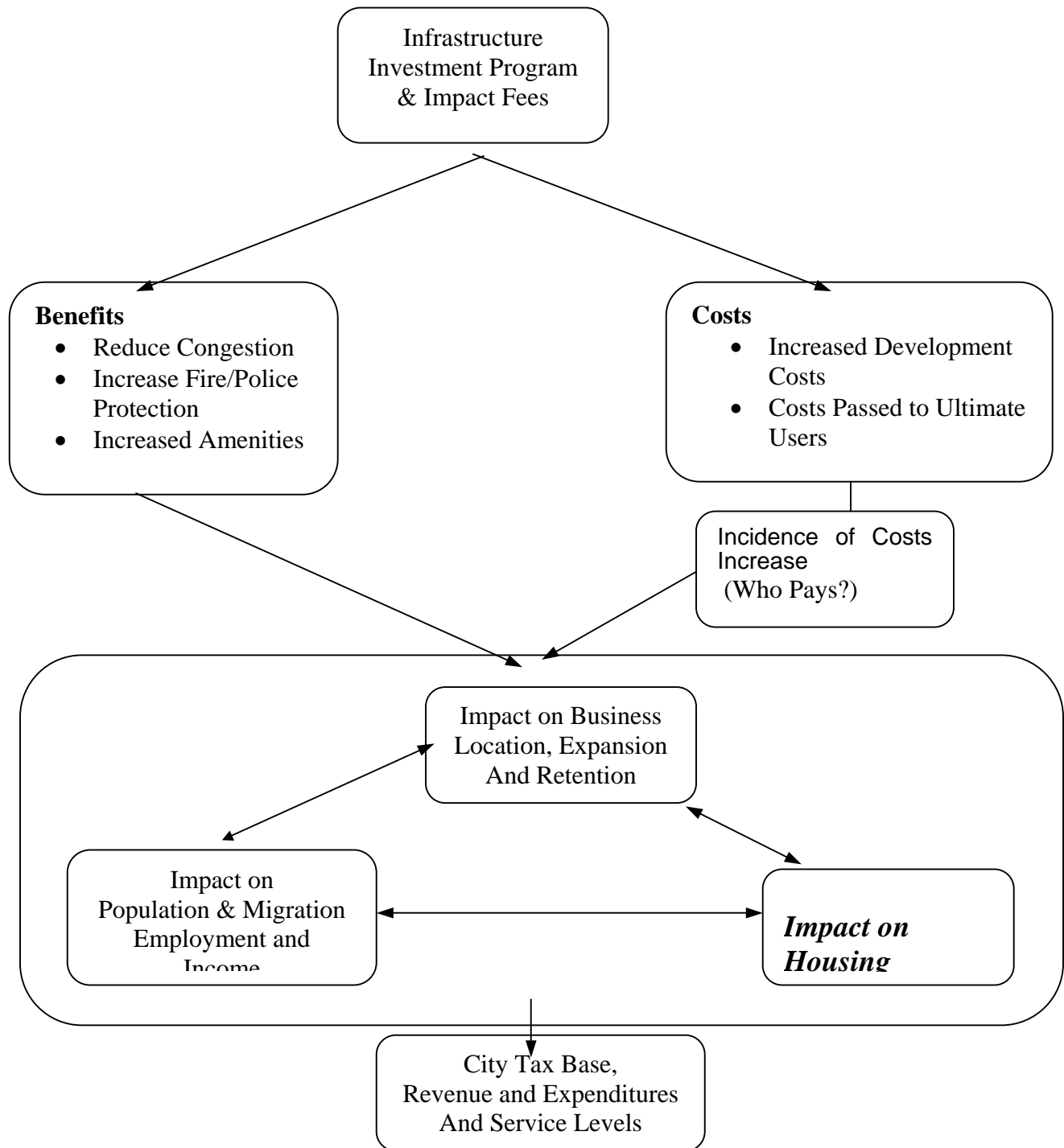
There are a series of direct and indirect impacts as the cost of public infrastructure improvements repercusses through a local economy as described in Figure 14-1.

Impact fees will cause an increase of development costs in both residential and nonresidential markets. The economic impact of that depends upon who pays for the increase. It is possible for the landowner, the developer, and the consumer to bear costs or to share them, as shown in Figure 14-2.

Thus, there are two real estate markets that could be affected by development impact fees. Landowners and developers are sellers and buyers in raw land; developers and consumers are sellers and buyers in improved land and buildings.

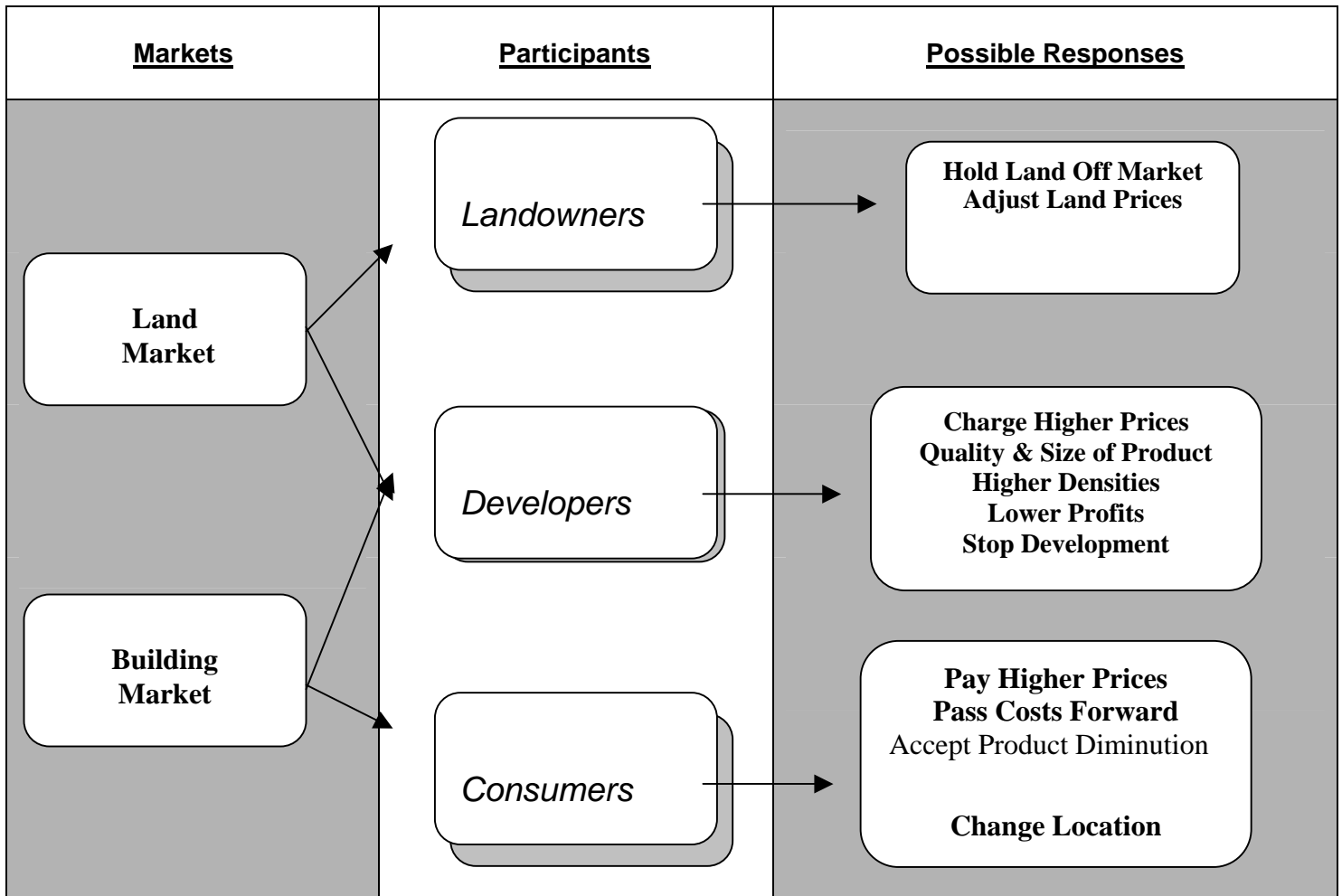
⁴ Coopers & Lybrand, Economic Impact of Proposed City-Wide Impact Fees for the City of San Diego, July 16, 1990.

Figure 14-1 CONCEPTUAL FRAMEWORK FOR ECONOMIC IMPACT ANALYSIS OF IMPACT FEES*



*Source: Coopers & Lybrand, *Economic Impact of Proposed City-Wide Impact Fees for the City of San Diego*, July 16, 1990

Figure 14-2
WHO PAYS FOR IMPACT FEES?
PARTICIPANTS IN THE DEVELOPMENT PROCESS*



*Source: Coopers & Lybrand, *Economic Impact of Propose City-Wide Impact Fees for the City of San Diego*, July 16, 1990.

Overall, what would be the direct impact of development impact fees upon regional real estate? Immediately, the cost of new construction would increase. Available supply would fall as the pace of development declines. The demand for new housing will fall, with lower cost single-family housing disproportionately affected. Businesses would face increased investment costs from higher building prices, and will attempt to pass costs on to customers or live with lower profitability.

Additionally, there are two other indirect impacts. First, in each segment of the real estate market, prices and rents of existing buildings will rise as the market tightens and as the higher Development impact fees are capitalized in prices.

Price Effect of Impact Fees

The economic impacts of development impact fees means that, if they are used exclusively to fund infrastructure in regions like Phoenix that have sustained major population growth, then eventually, like California, the fees could grow so high as to affect economic development and housing affordability.

California's high residential development impact fees significantly contribute to its high housing costs and prices. Among the sample of California jurisdictions, fees account for an average of **ten percent** of the median price of new single-family homes. Table 14-2 shows comparative residential impact fees.

Looking at the MAG Region, the development impact fees surveyed in this study provide an order-of-magnitude estimate of the economic effect of impact fees by jurisdiction, using a fairly simplistic methodology.

The effect of impact fees for Maricopa County municipalities is shown in Table 14-3. The average price increase for the comparable of a 1,850 square foot single-family house priced at \$155,042 before impact fees is 6.6%. This increase raises the price of that prototype home by \$10,245 – to \$165,287.

The highest effect on single-family home pricing is in Peoria North, Phoenix North, Glendale, Peoria South, and Chandler. Each of these municipalities creates an impact fee price difference of about 10% or above. The actual price effect would be higher if, like the California study, planning fees and building permit, plan check and inspection fees were included.

Table 14-2

Average Fees by Region, Sub-Region and Fee Type

REGION	Subdivision House				Total Fees	Infill House			Total Fees	Apartment Unit		
	Total Fees	Planning Fees	Building Permit & Plan Fees	Impact Fees		Planning Fees	Building Permit & Plan Fees	Impact Fees		Planning Fees	Building Permit & Plan Fees	Impact Fees
State Average	\$24,139	\$1,096	\$3,293	\$19,765	\$20,278	\$433	\$3,276	\$16,570	\$14,942	\$524	\$1,710	\$12,862
Bay Area	\$28,668	\$1,521	\$4,417	\$22,729	\$27,335	\$793	\$5,080	\$21,734	\$18,473	\$825	\$2,219	\$15,851
Central Coast	\$29,507	\$2,031	\$4,463	\$23,011	\$19,447	\$406	\$4,542	\$15,331	\$19,555	\$884	\$1,955	\$16,716
Sacramento	\$27,480	\$831	\$1,340	\$25,309	\$21,834	\$170	\$2,774	\$18,890	\$15,793	\$358	\$1,298	\$14,137
San Joaquin Valley	\$18,354	\$825	\$2,700	\$14,828	\$14,320	\$218	\$2,656	\$12,432	\$10,648	\$315	\$1,205	\$9,127
North State/Sierras	\$19,444	\$410	\$3,206	\$15,827	\$19,852	\$322	\$2,80	\$16,753	\$11,367	\$418	\$1,531	\$9,916
So. California	\$21,379	\$959	\$3,632	\$16,884	\$18,882	\$687	\$4,599	\$14,282	\$13,817	\$341	\$2,053	\$11,422

Source: California Department of Housing and Community Development, 2000

Table 14-3
Effect of Municipal Impact Fees on Single-Family Housing Price

	Impact Fee	Fee for 1,850 s.f.	% of Price Before Fee	Price With Fee
Peoria North	\$ 12,680	\$ 23,458	15.1%	\$ 178,500
Phoenix High	\$ 12,160	\$ 22,496	14.5%	\$ 177,538
Glendale	\$ 9,360	\$ 17,316	11.2%	\$ 172,358
Peoria South	\$ 9,008	\$ 16,665	10.7%	\$ 171,707
Chandler	\$ 8,178	\$ 15,129	9.8%	\$ 170,171
Queen Creek	\$ 7,309	\$ 13,522	8.7%	\$ 168,564
Surprise	\$ 7,268	\$ 13,446	8.7%	\$ 168,488
Gilbert	\$ 6,946	\$ 12,850	8.3%	\$ 167,892
Avondale	\$ 6,545	\$ 12,108	7.8%	\$ 167,150
MAG Region Average	\$ 5,538	\$ 10,245	6.6%	\$ 165,287
Scottsdale North	\$ 5,462	\$ 10,105	6.5%	\$ 165,147
Buckeye	\$ 4,962	\$ 9,180	5.9%	\$ 164,222
Goodyear	\$ 4,896	\$ 9,058	5.8%	\$ 164,100
Mesa	\$ 3,539	\$ 6,547	4.2%	\$ 161,589
Phoenix Low	\$ 3,470	\$ 6,420	4.1%	\$ 161,461
Fountain Hills	\$ 3,275	\$ 6,059	3.9%	\$ 161,101
Tolleson	\$ 3,114	\$ 5,761	3.7%	\$ 160,803
Cave Creek	\$ 2,945	\$ 5,448	3.5%	\$ 160,490
Tempe	\$ 2,275	\$ 4,209	2.7%	\$ 159,251
Scottsdale South	\$ 1,900	\$ 3,515	2.3%	\$ 158,557
Apache Junction	\$ 1,006	\$ 1,861	1.2%	\$ 156,903

Source: Maricopa Association of Governments, 2002

Community Facilities Districts

In contrast to development impact fees, funding infrastructure through property taxes has two price-lowering advantages that neutralize economic impact: first, costs are spread over a long time period and have a smaller impact on real estate prices; second, they are shared by a larger group, which lowers per-unit prices. The major disadvantage of property taxes is their political unpopularity with voters.

The American Planning Association reports that many communities in the fastest-growing regions of the nation – especially California and Florida – are using community facilities districts, which are based on property tax revenues from new development.⁵ Community facilities districts (CFD's) are special purpose municipal entities that are established to fund infrastructure in specified geographic area that will benefit from the services provided by those facilities – exactly the nature and function of developer impact fees. The main function of CFD's is to facilitate the construction of the types of infrastructure that are commonly covered by impact fees – streets, parks, water and wastewater facilities, police and fire stations, and drainage facilities.

⁵ Douglas Frost, *Making Growth Pay Its Way: Combining Facilities Districts With Impact Fees to Fund Infrastructure*, Public Investment, December 2001, American Planning Association

A key concern related to CFD's is whether or not the assessment base will grow fast enough to generate the revenues necessary to pay for interest on outstanding bonds. Defaults by CFD's have occurred in California, Colorado and Arizona, and as a result municipalities are reluctant to get involved. A good way for fiscally conservative municipalities to approach CFD's is to only agree to their formation when the developer is ready and able to establish a large buffer fund that will be used to make bond payments while the assessment base is too small to easily support the interest costs. Another alternative is to combine impact fees with CFD's, setting the impact fees at a rate that would cover interest payments only – about 10% of principal required for infrastructure construction.

Community facilities districts are an alternative to impact fees that lower negative effects on housing affordability and economic development. They are most practical in cases with few property owners – undeveloped land or nonresidential districts.

14.6 Conclusions

The system of development impact fees in metro Phoenix is complex for many reasons. There are 23 jurisdictions that assess fees independently, and for different kinds of facilities. Other mechanisms, such as exactions, community facilities districts and financing from the general fund are used in varying combinations with fiscal impact fees. All of these must be considered when comparing the costs of development in different communities. Additionally, municipalities charge planning, building permit, plan check and inspection fees to private development. Other than impact fees, no other municipal development fees of MAG member agencies were surveyed in this report.

Seventeen of 23 MAG member agencies charge impact fees. The regional average impact fee for these 17 municipalities is \$5,558. In general, MAG region municipalities charge higher fees than comparables from other surveys for water and wastewater, charge no school facility impact fees due to State legislation, but charge much lower impact fees for transportation. The highest fees in the MAG region are in the north area in Peoria North and Phoenix North. The lowest impact fees are in Scottsdale South and Apache Junction.

In comparing metropolitan Phoenix impact fees to other parts of the country, the results are somewhat inconclusive due to the absence of “apples-to-apples” comparisons. According to the Florida survey, the average single-family impact fee in Maricopa County is about 88% lower than the national average and nonresidential impact fees – especially office and industrial – substantially lower. According to the Maryland survey, metro Phoenix municipalities have impact fees more than 50% higher than the national survey sample average. According to the California study, which includes the largest number of counties and municipalities in its survey, metro Phoenix impact fees are 28% of the California average.

Each community must consider the balance of fees with potential revenues from economic development, impacts to housing affordability and feasibility of infill development. Though the cost of impact fees can be borne by developers, landowners, or ultimate consumers of buildings, in practice most impact fees are passed on to the building buyer or renter. Based on a prototype analysis, single-family impact fees create a price increase of 6.6% for the county average, and as high as 10 to 15% in five areas.

Clearly, impact fees for some Maricopa County jurisdiction are reaching levels that will have a negative effect on housing affordability – not only for the poorest residents, but also for the 64%

of workers who earn salaries below the regional average. These competing goals can be mitigated by offsets, such as Gilbert uses, if the jurisdiction can pay the development impact fees attributed to these uses from some funding source other than development impact fees. Though fees should not be mitigated at the cost of level of service standards, MAG member agencies should start explicitly considering the unintended consequences of impact fees upon their economic development competitiveness and housing affordability.

In the MAG Region, there is no provision for regional infrastructure impact fees. Though there are few examples around the nation, there are enough examples to show that the cost of regional infrastructure can be implemented.

Overall, most municipalities seem to do a good job of ensuring that local development approvals are accompanied by some means to provide or finance infrastructure that will be required to serve it. There are some factors that jeopardize local government's ability to maintain adequate infrastructure standards. Those that were most often mentioned in the planning department interviews are:

- When one community approves a project that creates infrastructure deficits in another;
- When one local government approves a large scale project that creates regional infrastructure deficits;
- When early impact fees are not of a sufficient scale to purchase park sites and students in newly developing areas often arrive long before the facility funding to accommodate them. This delayed purchase can cause these uses to be sited on remnant parcels, and the potential to develop them as focal points for neighborhood and community identity is lost forever. The municipal ability to set impact fees for school facilities are a particular drawback in Arizona, since most other states have legislation enabling these.
- The provision of facilities does not equate to the funding of the services that they provide. Facilities must be maintained and staffed. In the case of a newly emerging community that has not yet captured the commercial uses that generate revenues for service costs, shortfalls in the operating budget can create both operational and upkeep shortfalls.

There are cases of some local governments using innovative new tools to mitigate these detrimental effects. In addition to development impact fees, these include:

- Adequate public facilities ordinances
- Agreements such as the Southwest Cities, Schools and Developers Partnership.
- Comprehensive development agreements, such as the one recently negotiated by the Town of Goodyear.

14.7 Recommendations

1. It would be useful to local governments to have an updated comparative development impact fee survey on a regular basis. This could be accomplished by MAG member agencies providing an updated fee schedule each time that the fees are updated. MAG would keep the table updated based on this information. This process would be simplified if MAG member agencies adopted a common language to describe the different fee categories that each uses. As most of the communities surveyed retained Tishler and Associates as a consultant for impact fees, perhaps their methodology could provide the basis for the definitions. Alternately, the California Department of Housing and Community Development methodology, which includes all development fees – not only impact fees – could be used.
2. Both municipalities and counties should consider the impact of development impact fees upon uses that they would like to attract to promote their objectives for economic development, housing affordability and infill. (The Town of Gilbert includes a line detailing economic development offsets in their fee schedule.) Although the statutes specify that fees must be assessed in a "non-discriminatory manner" local governments can offer the incentive of paying their fee from some other funding source. Combining community facilities districts with impact fees can also mitigate unintended consequences upon economic development and housing affordability.
3. When a community is considering approval of a development that will have adverse impacts on a neighboring jurisdiction, it should put mechanisms in place to mitigate this damage, such as intergovernmental agreements for sales tax sharing and/or joint development impact fee benefit areas. This kind of an agreement could offer participants protection from such externally produced burdens. It would be based on an agreed upon threshold of impact. These could be accomplished as legislation, by unanimous regional compact or as an informal policy or intergovernmental agreement between two or more jurisdictions.
4. Local governments should discuss the feasibility of development impact fees and/or extraterritorial jurisdiction to mitigate un-funded excesses of regional system capacity generated by an approval in a single community. As in the case of policies to mitigate inter-local development impacts, these could be based on some agreed upon threshold of scale. In the case of regional facilities, these policies could be adopted as legislation, or by a unanimously agreed-to regional compact.
5. MAG member agencies should support better school and park siting by adopting a joint legislative platform to extend the amount of time that park and school sites can be reserved as a part of the development approval process. Additionally, MAG member agencies should continue to champion school facility impact fee legislation in Arizona.
6. In undeveloped or emerging areas, local governments should work with their school districts to ensure that development does not precede the school capacity that is required to serve it. In assessing school Development impact fees, Apache Junction blazed a trail that several other communities were prepared to follow, had the court decision been different. School Development impact fees have been introduced and overturned every year at the legislature for a decade, and this may continue. Queen Creek, Buckeye and Glendale ensure adequacy with the adequate public facilities ordinance⁶. Goodyear, Litchfield Park and

⁶ See MAG RGS Paper #1 for more detail.

Avondale use a sub regional compact that includes participation by school districts and developers. These means may be more feasible.

7. Communities that do not yet have sufficient commercial revenue generating uses in place to support the service costs necessary to operate and maintain capital facilities required for new development may want to negotiate development agreements for some portion of early service costs, as was recently done in Goodyear.

15. Intergovernmental Planning

Best Practices Paper #4 presents local examples of intergovernmental planning that address four specific issues identified by interviewing planning staff of MAG member agencies.

Issues

The reasons cited for selecting the topic of this paper were all related to problems caused by fragmented jurisdictional authority in taxing, fragmented public facility and service provision, and cumbersome development approval processes. Four specific issues emerged from the interview process:

- **City/county planning differences** – Cities and counties have different tools available to them to regulate development. Counties are somewhat restricted in their ability to control lot splits and provide certain services. This causes problems more on the urban/rural fringe where what was once county land could become urbanized and annexed into a city or town.
- **The need to share both the cost and benefit of development on municipal borders** – In some instances a community may suffer the impact of development without experiencing the benefit of that type of development.
- **Collaborative planning for schools** – Cities and towns are not responsible for providing public schools. This responsibility lies with school districts. School district planning is historically short-range and not well coordinated with city and town planning efforts.
- **Potential economies of scale in the development approval process** – There are potential economies of scale that can be achieved through multi-jurisdictional cooperation in the development review process.

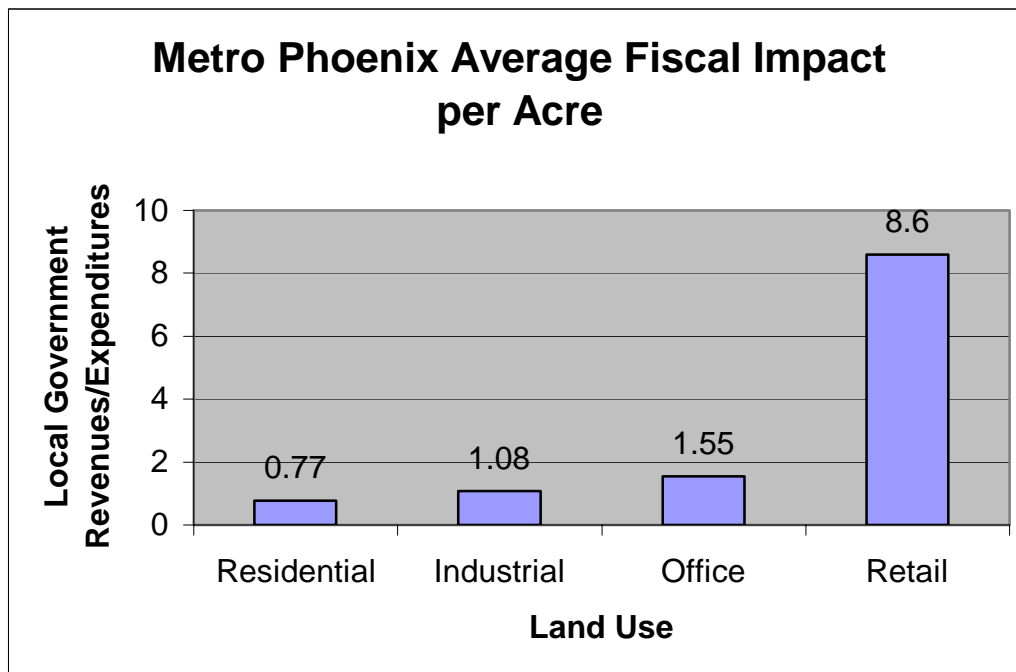
The contiguous Metropolitan Phoenix urbanized area can be best described as a patchwork quilt of governance. It is comprised of 24 cities and towns, two counties, two tribal governments, over 55 school districts and a plethora of special purpose districts such as flood control districts, community facilities districts and water districts. This fragmentation of jurisdictional authority creates challenges for all, land use planners in particular.

Nationwide, there are several different models for inter-jurisdictional cost-benefit sharing and conflict resolution. These range from voluntary co-operation (which is the norm and the least effective in solving regional problems) to state mandated planning goals replete with state regulatory authority.

A 2001 MAG Regional Growing Smarter Implementation Project report examined the fiscal impact of various land uses by local jurisdiction. Figure 15-1 illustrates the mean average impact of these land uses for Metro Phoenix local governments for each land use type. A ratio of 1 is the "break even" point. Residential development, with an average ratio of .77 generates a deficit unless there is a proportionate share of commercial uses to balance it.⁷

⁷ During the preliminary planning department interviews, several emerging communities stated that this imbalance was their most pressing planning issue. Recognizing the potential municipal fiscal crisis that this could cause, the town of Goodyear has required developers to fund service costs during the early years. This was established by development agreement.

Figure 15-1



In emerging areas, growth generally starts with residential development and, as the requisite number of “rooftops” is in place, retail, office and other commercial uses follow. Industrial and office development contributes to the local and regional economic base. Sales tax, on the other hand, plays an especially important role in municipal budgets, funding from 40% to 50% of the General Fund for some large cities as illustrated in Table 15-1.

Table 15-1.
SALES TAXES AS A PERCENT OF
LOCAL OPERATING REVENUE⁸

City/Town	Share	City/Town	Share
Tempe	55%	Tolleson	39%
Paradise Valley	54%	Glendale	39%
Goodyear	51%	Phoenix	37%
Surprise	50%	Gilbert	36%
Carefree	47%	Buckeye	35%
Litchfield Park	47%	Avondale	35%
Scottsdale	45%	Fountain Hills	33%
Cave Creek	44%	Guadalupe	31%
Chandler	41%	Peoria	31%
El Mirage	41%	Wickenburg	31%
Mesa	40%	Youngtown	26%
Gila Bend	39%	Queen Creek	20%

Sources: City Budgets, 1999-00, 2000-01; Applied Economics, 2001.

Intergovernmental Planning Successes

City/County Infrastructure Planning

Arizona legislation makes it difficult to plan for infrastructure in an environment where there are multiple jurisdictions adjacent to or close by one another. This is especially true for linear facilities such as water, wastewater and streets. Since counties do not receive the same state-shared revenues to fund the array of services that cities and towns do, counties typically do not provide public infrastructure as cities do. This can lead to inefficiencies in service provision. However, State statutes do provide for some extra-territorial jurisdictional planning. The statutes on extra-territorial jurisdiction allow regulatory participation in the development approval process of a neighboring jurisdiction only when there is a lack of contiguous planning in place.⁹

Problems related to county islands or annexation of developed county areas include substandard “wildcat” subdivisions and related issues:

- Poor road conditions;
- Dust and respiratory problems;
- Flooding problems;
- Poor emergency response;
- Limited utility access;
- Low domestic water volume and water pressure;
- Legal access to parcels often lacking; and
- Increased zoning violations.

⁸ Applied Economics, Maricopa Association of Governments Growing Smarter Implementation. Sales Tax Base Final Report, October 2001

⁹ Although there is this authority in many states, Gilbert Planning Director, Gerry Swanson, AICP (who has worked with the more stringent extraterritorial controls) notes that it does not provide incentive toward conflict resolution, but only gives one jurisdiction the authority to stall development in another.

Problems occur at the city/county fringe where developers will seek approval in the county, to avoid building to city subdivision standards or to avoid paying municipal development fees.

At least two local communities (the Town of Gilbert and the City of Mesa) have worked with Maricopa County to improve their ability to plan for new development. Both communities provide a "carrot" for developers to annex and seek approval in the City. Withholding municipal water and wastewater service from development that is approved in the County is a method of encouraging developers to seek approval within the City. Although local governments have long used water and wastewater service provision as an incentive for annexation, these two communities have worked with the County to develop policies that were formally adopted and are further described below. The County incorporates these policies into their development approval process.

The Town of Gilbert/Maricopa County Agreement

The Town of Gilbert and Maricopa County have informally agreed that the Town will not provide domestic or reclaimed water service to unincorporated new development in its planning area. The County agreed to require development to meet the Town of Gilbert's planning standards for new unincorporated development within the Town's planning area. This has been adopted as a part of the most recent Town of Gilbert General Plan.

The Mesa Water and Wastewater Service Ordinance

The City of Mesa has taken a different approach by adopting an ordinance that requires un-subdivided parcels located outside of the City of Mesa corporate limits to be annexed before receiving City water and/or wastewater service.

Cost and/or Benefit Sharing Agreements

At least three inventive planning solutions have been developed in the valley to create equity between communities when commercial development is near borders in recognition the significant impact this can have on an area.¹⁰

The North Valley Area Specific Plan

In a collaborative planning process, the two cities proceeded to develop a joint specific plan for a larger retail development that was subsequently adopted by both the Glendale and Peoria City Councils. The plan was successful in maximizing the economic benefits to both jurisdictions while setting the stage for equity with respect to infrastructure costs and a providing a cohesive development pattern.

The Tempe/Chandler Revenue Sharing Agreement for Arizona Mills

Litigation regarding the proximity of two competing shopping malls was resolved by means of an intergovernmental agreement that was signed by the mayors of Tempe and Chandler and the two developers. The Arizona Mills mall was constructed in Tempe and revenues are shared with Chandler. Chandler, in turn agreed to share 10% of revenues from subsequently developed centers of over 400,000 square feet within the Chandler corporate limits.

¹⁰ Other joint efforts, such as between Phoenix and Scottsdale in the development of the emerging northeast area have been discussed. It seems clear that the complexity of existing development and traffic patterns, flooding issues and a myriad of other physical, fiscal and political issues can make some the closure of IGA's more difficult than others.

The Tempe/Chandler agreement does not contain a sunset clause. Once the stipulated threshold of payments is met by each community revenue sharing continues in perpetuity. Although the 10% revenue sharing agreement can be adjusted upon mutual agreement by both cities, there is the potential for future conflict should a substantial shift in the balance of sales tax revenues occur.

The Queen Creek/Gilbert Revenue Sharing Agreement for the Seville Resort and Related Commercial Uses

The towns of Gilbert and Queen Creek recently entered into an agreement to share revenues from the Seville project, a 1,370-acre project centered on a resort and golf course. The agreement specifies that Gilbert will annex the land for the project and will pay 50% of the transaction privilege taxes to Queen Creek for 10 one-year periods.

Planning for Schools

In 1996, three west valley communities worked in accord with six school districts and six development community representatives to establish a compact to link the development approval and school planning processes. The landmark Southwest Cities, Schools and Developers Partnership Compact established a much-needed link between the development approval process and planning for schools.

The following excerpt from the Southwest Cities/Schools/Developers Partnership Compact describes the issue:

"Local governments, school districts and developers traditionally have not jointly participated in general planning and the conceptual planning of master planned communities. Attention should be given in the planning process to encourage neighborhoods and subdivisions to provide lifestyles that develop a sense of community that unifies families and residents. Tax burdens must be examined for fairness and derived benefits to enable families and residents to enjoy a well-planned community that minimizes travel to work and maximizes schools as an asset for education, recreation and community activities."¹¹

Several school sites have been dedicated because of the planning that occurred since the compact was signed, including those by Sunchase in Estrella Mountain Ranch, Suncor in Palm Valley, Continental Homes in Canyon Trails and the Roston Corp in Estrella Vista.

¹¹ Southwest Cities/Schools/Developers Partnership Compact, 1996

Economies of Scale in the Development Approval Process

In some rapidly growing jurisdictions, the number of development approval applications can be overwhelming to process.¹² Given that many communities conduct the same kind of review, collaboration between communities can eliminate some redundancies. This benefits local governments, by reducing individual caseloads. Eight valley communities have joined forces to develop a process that enables residential plan review by any one of the participating jurisdictions. Participating cities and towns within Maricopa County developed an intergovernmental agreement and procedure to share the plan review process. At this time, the participating jurisdictions are Avondale, Cave Creek, Gilbert, Glendale, Litchfield Park, Peoria, El Mirage and Surprise. After several meetings and document exchanges a flow chart, task list and procedure were developed.

The Town of Surprise Development Approval Planning Manager is hopeful that the program will inspire the development of similar processes for other plan reviews, if applicable.

The participating jurisdictions have adopted the same building codes that pertain to residential construction. The building codes to be used are the 2000 International Residential Code and the 2000 International Building Code.

The participating jurisdictions will use common plan review application forms, worksheets, and plan review checklists, inspection checklists and construction handouts.

The benefits of this program include:

1. It provides substantial cost savings to the homebuilders. Plans are submitted and homebuilders are charged a one-time plan review fee. Currently, homebuilders must submit and pay for independent plan reviews from each jurisdiction.
2. It increases uniformity in residential building code applications and interpretations among plan review and inspection staff.
3. It increases the efficiency of all participating plan review departments by reducing backlogs, shortening the standard plan review process and reducing the need for outsourcing.

Conclusions

There is no urban region that can be used to create a model for local collaborative planning in Metropolitan Phoenix. Our rapid growth and our unique patterns of development, jurisdictional authority, state planning law and taxing authority create a planning environment that is truly unique. The lack of directly applicable models creates a planning environment that is like a laboratory. This presents both opportunities and challenges.

The local examples cited in this paper represent new, innovative approaches that are being used to overcome planning problems that exist between one or more jurisdictions. It would be beneficial for planners to use what seems applicable, to watch the progress of these efforts over time, and to share other innovations with colleagues and decision-makers.

¹² Keeping up with a vast number of applications was cited as one of the top issues for newly developing communities in the preliminary planning department interviews for this project.

16. Infill Development

The MAG Planners Stakeholders Group selected Infill Development as a topic for a Best Practices Paper #5. Members of the group interviewed cited the following reasons for their choice:

- The Growing Smarter/Plus legislation provides support for the creation of infill incentives districts. Although no additional authority was granted, new language explicitly authorizing their use was added.¹³ This may make local communities more comfortable with the use of this technique.
- Several communities have used this legislation to provide a framework for implementation policy within the Growing Smarter General Plan Update. A good example of this approach is the new City of Phoenix General Plan section on Infill Policy¹⁴. The City of Chandler also has an infill policy that was adopted by a resolution of Council on December 13, 2001.¹⁵
- Several communities are in the process of developing or revising infill incentive programs. It would be useful to have "nuts and bolts" background information on effective processes that have been used to promote infill development in other places.
- Given that rapid transit may soon be a reality for several valley communities, a lack of immediate and effective urban policy to create vital mixed-use development patterns along these lines now may result in lost opportunities. Successful infill development policy would set the character of infill areas now and in the future.
- Demographics show there are many people approaching life stages that will create a new market for vital mixed-use urban centers, the kind urban infill often creates. This opportunity may be lost if the right kind of strategies are not developed and implemented.

Background

Infill can be simply defined as

"... the development and redevelopment of vacant and redevelopable parcels of land that are served or could be served by utilities, and are surrounded by established urban areas. Generally, these parcels of land have been by-passed in the normal course of urbanization."

-City of Albuquerque Infill Study

Sound infill policy must include consideration of where density should be encouraged. How infrastructure, neighborhood policies and city processes impact this potential must also be considered.

In recent years, several local studies have identified barriers to and opportunities for infill development. The City of Phoenix Planning Department published a study on infill entitled Urban Infill Strategies Phase 1 Opportunities and Barriers Process in March of 1995. The study was the result of interviews with over 60 representative stakeholders in the infill development

¹³ For language in statute, see Appendix A.

¹⁴ Appendix B is a copy of the City of Phoenix infill policy found in the General Plan.

¹⁵ Appendix C included the City of Chandler Infill Development Policy as adopted by Council.

process. Home builders, apartment developers, commercial developers, housing providers, bankers, appraisers, realtors, neighborhood activists, zoning attorneys, City Council and Planning Commission members, and City staff from various departments were included.

Although participants were characterized as optimistic about the future of infill development, the study identified more barriers than opportunities. Some of the barriers mentioned included crime and the perception of crime, barriers in municipal development approval process, disjointed school districts, and difficulties in obtaining financing due to a lack of comparable projects to use for appraisals.

In 1999, the Land Use Subcommittee of Valley Forward published Shape Your City -- Urban Infill for the Concerned Neighbor. The study defined infill and discussed design elements that make infill important.

This work went on to note that infill development potential is affected by a wide variety of factors and that no one stakeholder (local governments, developers, or citizens) can change all of them. These factors were summarized in the report as follows:

- Resistance to change.
- Inadequate local government processes to respond effectively to unusual or mixed-use development concepts.
- Difficulty in obtaining financing for development forms that, as yet, do not have a fiscal track record of viability.
- A reluctance on the part of developers to risk departure from easy and/or proven ways of developing.
- Neighborhood resistance based on fears of architectural incompatibility and perceived traffic impact.
- Onerous cost of assembling small parcels.

Comprehensive infill development policy is relatively new in the MAG region. Locally, only Phoenix has had housing infill incentives programs for a decade. Glendale and Chandler have adopted similar programs within the last several years. It is difficult to measure the success of these programs given the short timeframe that they have been in place. Chandler has funded projects and still has a fiscal allocation to fund more.

There is currently a convergence of market trends, commute sheds and traffic patterns, and impending rapid transit facilities that require the implementation of comprehensive infill strategies to create immediate policy for mature or largely developed communities.

Local Government Processes to Promote Infill

Two case studies, Austin and Tempe, are examples of innovative approaches to creating processes that are easy to navigate and help to remove barriers to infill. In looking at these examples, it is clear that partnerships between developers, local governments and residents are necessary to establish effective, far-reaching infill policy. Although any one of these three stakeholders can initiate such a process, the recent examples of successful processes indicate that local governments are in an excellent position to facilitate this exchange. Some tools that can be used for this exchange and their applicability to Arizona follow the two case studies.

City of Austin Smart Growth and Development Matrix

Austin, Texas was selected as a case study because it has an innovative, vertically consistent development approval process and is somewhat analogous to cities in the MAG region for the following reasons:

- Austin has several contiguous jurisdictions.
- It fits the "western" model of development (with the bulk of growth occurring in recent decades).
- It operates under similar state planning statutes (with few mandatory growth management policies and an emphasis on private property rights and local control).
- It has a similar tax structures (with relatively low property taxes and at least 1/3 of the municipal budget funded by sales tax revenue).

In a program unlike any in the country, the City of Austin has incorporated a smart growth and development matrix into their development approval process. This process was initiated upon the election of a new mayor with a strong commitment to revitalizing the central city.

The City of Austin Smart Growth Development Matrix was expanded to include comprehensive policies for smart growth and development (Figure 16-1). The matrix is based on a points system awarded for certain criteria. Projects with a score of 0 to 250 points are given no additional consideration. Those with 251 to 335 points will qualify to have 50% of all eligible fees waived. For highly desired commercial projects in the right locations, applicants are eligible for up to a 5 or 10-year incremental tax break.

City of Tempe Code Audit and Revision

There is a growing recognition that local government development codes and processes are often outdated for infill, transit-oriented development, affordable housing and new-urbanist development projects. Many zoning ordinances are similar to those based on the 1920's model legislation that was adopted, place by place, throughout the country. The predominant focus was on the separation of land uses. Fortunately, among the many forces that limit infill development, city codes and processes may be the one which local governments have the most ability to control.

Figure 16-1 Austin, Texas Smart Growth Criteria Matrix

SMART GROWTH CRITERIA MATRIX City of Austin Transportation, Planning and Design Department				REVIEWER: _____ MARK ONE: <input type="checkbox"/> SELF SCORE <input type="checkbox"/> PRELIMINARY SCORE <input type="checkbox"/> FORMAL SCORE					
DEVELOPMENT: _____		DATE OF REVIEW: _____		POINT SYSTEM			SCORE		
GOALS	CATEGORY	ELEMENTS	CRITERIA	WEIGHT	VALUE	MAX. POINTS AVAILABLE	SCORE	TOTAL POSSIBLE	
			Criteria based on information that is not complete or available for scoring						
	Eligibility	1. Neighborhood Plans	Project does not conflict with adopted Neighborhood Plan for the area.						
		2. Historic Review	Projects proposing demolition/modification of historically significant buildings require review.						
		3. Incentive Package	Project may not receive Smart Growth Zone Specific incentives.						
SMART GROWTH GOAL I: Determine How and Where Development Occurs	Location (87 points)	1. Smart Growth Zones (Eligible for only one zone - A, B, or C for a maximum possible 45 points)							
		A. Downtown	1. Anywhere 2. Within a 1 block radius of a CMTA bus stop 3. Consistent with transit station area plan	5 5 5	5 4 20	25		0	
		or B. Urban Core	1. Anywhere 2. Within one lot deep of a Smart Growth Corridor 3. Consistent with transit station area plan	4 4 4	3 4 16	12		0	
			or C. Desired Development Zone (DDZ) inside City Limits	1. Anywhere 2. Within one lot deep of a Smart Growth Corridor/park & ride 3. Consistent with transit station area plan	3 3 3	1 3 9	3		0
			2. Location Risk	A. Focus on area of economic need B. A "Trail Blazer" in an untested market	4	3	12		0
	Process (135 pts)	1. Neighborhood Planning (Choose A or B)	A. Requires dialogue and support by adjacent neighborhoods (Projects outside of Downtown) B. Downtown Projects			75 35		0	
		2. Design Commission (Choose A or B)	A. Presentation & endorsement of plans without conditions (Projects outside of Downtown) B. Downtown Projects	5	2	10 50		0	
		3. Historic Landmark Commission	A. Presentation & endorsement of plans without conditions B. Historically zoned buildings or buildings within a historic district	5	5	25 50		0	
	Critical Mass (24 points)	1. Threshold Density A. Population (DUA)	1. Meets minimum threshold to support transit (7 to 12 du/a average w/in one lot deep of Proposed Smart Growth Corridors, 12-25 du/a average in Downtown) (Consistent with transit station area plan)	3	4	12		0	
		B. Employment (FAR)	2. Meets minimum threshold to support transit (Min. FAR of .35 w/in one lot deep of Proposed Smart Growth Corridors or min. FAR of .5 in Downtown) (Consistent with transit station area plan)	3	4	12		0	
	Land Use (110 points)	1. Land Use Contribution (Eligible for only one-A,B, or C for a maximum possible 35 points)							
		A. Downtown Projects	1. Regional draw - retail (anchor retail), entertainment, or cultural center 2. Greater than 200 new housing units	5 5	3 4	15 20		0	
		or B. Urban Core Projects	1. Regional draw - retail (anchor retail), entertainment, or cultural center 2. Variety of housing types (apartments, rowhouses, SF) 3. Greater than 200 new housing units	4 4 4	3 3 1	12 12 4		0	
		or C. Traditional Neighborhood Projects	1. Meets TND codes and ordinances 2. Variety of housing types (rowhouses, gar, apts, sf) 3. Town Center with neighborhood retail	3 3 3	3 3 3	9 9 9		0	

February, 2001
Version 9
1 of 3

Figure 16-1 con't. Austin, Texas Smart Growth Criteria Matrix

GOALS	CATEGORY	ELEMENTS	CRITERIA	POINT SYSTEM	SCORE	TOTAL POSSIBLE	TOTAL SCORE
			Criteria based on information that is not complete or available for scoring	WEIGHT	VALUE	MAX. POINTS AVAILABLE	
		2. Land Use Compatibility	1. Part of a Downtown District Plan 2. Consistent with a Corridor Plan 3. Consistent with a Transit Node Plan				0 0
	Land Use Continued (110 points)	3. Mixed Use per Building (Min. 20% for each use - residential, retail, office)	A. Includes residential above 1st floor B. Street level pedestrian uses C. Includes 2 uses D. Includes 3 uses	5 5 5 5	4 3 3 5	20 15 15 25	75 0
SMART GROWTH GOAL II: Improve Our Quality of Life	Urban Design (44 pts)	1. Building Facade Treatment	A. Division of facade into traditional 30'± increments B. Variety of treatment and human scale details C. 50% or more of facade in glass at street level D. Well-defined entrances every 50' on street frontages	2 2 2 2	2 2 2 2	4 4 4 4	16 0
		2. Compatibility with Surrounding Area	A. Appropriate or compatible massing B. Integration of height with abutting facades C. Rear building treatment D. Mechanical equipment screened where visible	2 2 2 2	2 2 1 1	4 4 2 2	12 0
		3. Provision of Accessible Public Outdoor Space	A. Area greater than 500 ft² B. Provides table and chairs C. Landscaping, including trees D. Pedestrian scaled lighting, min. 3 footcandles E. Located adjacent to Greenway or Street F. Provision of outdoor public art	2 2 2 2 2 2	2 2 1 1 1 2	4 2 2 2 2 4	16 0
	Multi-modal Transportation Elements (134 pts)	1. Transit Coordination	A. Project includes CMTA participation / coordination B. Provides facilities associated w/ bus to rail transfers	4	5	20	20 0
		2. Building Location on Site	A. Oriented to pedestrian network B. No drive through facilities C. Buildings built up to right of way D. Parking in rear of lot behind building	3 3 3 3	1 1 4 2	3 3 12 6	24 0
		3. Streetscape Treatment for Maximum Pedestrian Comfort	A. Street trees min. 4" caliper, 30' o.c. on all frontages B. Use of smaller scale pavement (pavers or scoring) C. Rain protection (awnings, arcades) D. Maintain existing alleys or extend walkable street grid plan E. First floor level at street level or within 18" F. On street parking along street frontages G. Min. 12' wide clear sidewalk along street frontage H. Provision of pedestrian scale street lighting I. Continuation of existing sidewalk networks J. Crossing treatment at street corners (bulb outs, crossings)	3 3 3 3 3 3 3 3 3 3	3 1 1 3 1 3 3 1 2 4	9 3 3 9 3 3 9 3 6 12	60 0
		4. Alternative Pedestrian and Bicycle Access	A. Greenways 1. Access to and no interruption of greenbelt trails 2. Office, retail, or residential uses facing creek B. Internal Sidewalk Network 1. Pedestrian network linking buildings on site and to streetscape sidewalks	2 2 2	2 2 4	4 4 8	16 0
		5. Bicycle Friendly	A. Bike racks (1:10), Bike Lockers (1:50) available B. Locker room facilities, showers and dressing room C. Bicycle linkages	2 2 2	3 2 2	6 4 4	14 0
	Parking (36 pts)	1. Structured Parking	A. Structured and/or underground parking B. Ground floor of structured parking retail C. Provides for shared parking for adjacent businesses D. Division of facade into 30'± increments & detailing	3 3 3 3	4 3 1 2	12 9 3 6	30 0
		2. Driveway	A. Minimizes curb cuts along front property line	2	3	6	6 0

February, 2001
Version 9
2 of 3

Figure 16-1 con't. Austin, Texas Smart Growth Criteria Matrix

GOALS	CATEGORY	ELEMENTS	CRITERIA	WEIGHT	VALUE	MAX. POINTS AVAILABLE	SCORE	COMMENTS	TOTAL POSSIBLE	TOTAL SCORE
			Criteria based on information that is not complete or available for scoring							
	Housing (40 pts)	1. Reasonably Priced Housing	A. 20% of units for 80% (4 person) AMFI households B. 20% of units for 60% (4 person) AMFI households	5 5	3 5	15 25			40	0
	Local Economy (48 pts)	1. Neighborhood Stabilization	A. Traditional neighborhood retail uses B. Neighborhood supported uses	3 3	3 3	9 9			18	0
		2. Promote local business	A. Provision / retention of space for locally owned business B. Project supports or builds local music / film industry C. Use of local contractors and architects	3 3 3	4 4 2	12 12 6			30	0
		1. Building Construction and Environmental Impact (Choose A or B)	A. Green Building Program Participation One star multi-family Two star multi-family / one star commercial Three star multi-family / two star commercial Four star multi-family / three star commercial Five star multi-family / four star commercial B. LEED Certified Rating Silver Rating Bronze Rating Gold Rating C. Green Choice Renewable Energy Program	5 5 5 5 5 5 5 5 5	1 2 3 4 5	5 10 15 20 25 10 15 20 25			25	0
				5	2	10			10	0
SMART GROWTH GOAL III: Enhance Our Tax Base		1. Tax Base Enhancement	A. Meets AISD 60/40 Goal	4	3	12			12	
		A business case analysis for proposed developments seeking financial incentives is handled separately.				Check:	0			
								% of Total Points		
			GOAL 1 Determine How and Where Development Occurs			50%	0.0		356	0
			GOAL 2 Improve our Quality of Life			48%	0.0		337	0
			GOAL 3 Enhance our Tax Base			2%	0.0		12	0
			TOTAL			100%	0.0		705	0

MATRIX THRESHOLD LEVELS

0 to 250 points = No Additional Consideration

251 to 335 points = 50% of All Applicable COA Fees Waived (GF & Enterprise)

For projects that score in the two highest levels a business case analysis sets a not to exceed (NTE) value for the incentive package. The NTE value is based on the present value of the increase in property tax revenues generated by the project over a 5 or 10 year time period. The amount of the incentive package can include up to 100% of applicable COA fees, utility charges (at a 5 or 10 year break even level) and the cost of planned infrastructure accelerated in time for the project.

336 to 420 points = 5 Year Incremental Tax Value NTE

421 to 705 points = 10 Year Incremental Tax Value NTE

February, 2001
Version 9
2 of 3

As the most densely populated and built-out city in the region, all development in Tempe is infill and redevelopment. For this reason, Tempe is often the first to adopt new planning practices geared for mature communities. One such example is the comprehensive code audit and revision that is currently underway. Although the City of Tempe Land Use and Development Code is in draft form and may be revised by subsequent review and comment processes, it seems likely that some landmark changes will result addressing:

- *Variances*
- *Parking Requirements*
- *Sign Ordinance*
- *Mixed-Use Zoning.*
- *Accessory Dwelling Units*
- *Commercial Districts*
- *Planning Commission*
- *Hearing Officer*
- *Greater Staff Autonomy*

Techniques for Facilitating Collaboration for Infill

There are many participants, aside from a city, who contribute to the viability of successful infill development. Some of these include neighbors, landowners, public schools, developers and lending institutions. The puzzle becomes even more complex when one considers the tax structure, economic conditions, legislative policy and local politics.

Local government is ideally situated to facilitate discussion and collaboration between the various stakeholders to overcome barriers and create opportunity. Work by the City of Phoenix, the City of Albuquerque, and others abound with tools that can be used in discussions that bring all stakeholders to the table. This section presents some of those tools.

The following section reviews policy issues for various infill facilitation techniques that have been applied elsewhere in the U.S.:

Reduced Service Standards and Impact Fees in Target Growth Areas

Policy Issues for Arizona:

- If there is no set policy guiding where development should occur, landowners outside of the incentives area will strenuously oppose these policies.
- The rationale for differential standards and impact fees must be thoroughly documented to avoid a constitutional challenge.
- Aggressive expansion of forms of transportation other than the automobile will be required in the denser areas with higher levels of congestion.
- Also, under Arizona law, local governments would need to find another source of funds to pay the costs of providing infrastructure to urbanized areas where development fees are not assessed.

Implement a Parcel Assembly Program and Strategic Land Banking

Policy Issues for Arizona:

- Land assembly can be very expensive, particularly if unanticipated expenses arise associated with environmental clean-up, title encumbrances, and similar expenses.
- Land banking can require considerable start up money in the early stages of the program, before property is resold. If state or federal seed money or loan money is not available, it may require strong citizen support for a bond approval or a unique situation (such as Cleveland's tax delinquency holdings).
- While the land is under local government ownership, it is removed from the tax roles. (Although it may not be producing tax revenue anyway if the property is in default.) Property maintenance will also be necessary until the property is resold. It is possible that a community could generate revenue to offset these costs by leasing the property for some interim use.
- Land banking may not be popular with the real estate industry, particularly those who may profit from land speculation.
- It may be difficult to carry out land assembly and banking on a significant scale without some use of eminent domain powers. It is important to demonstrate a valid public purpose and to proceed with acquisitions based on an adopted plan, particularly if eminent domain is used.

Demonstration Projects and Public Education

Policy Issues for Arizona:

- Demonstration projects generally require adequate investment of public funds to design and construct a quality project that can effectively convince others of a projects viability and acceptability. If the project can motivate private and non-profit developers to undertake similar projects, it will be a worthwhile investment.

Temporary Property Tax Exemptions for Multifamily Housing

Policy Issues for Arizona:

- Tax exemptions may not provide much incentive for development of infill sites because, compared to other parts of the country, Arizona property taxes are very low.
- Existing Arizona statutes do not authorize property tax exemptions, and new legislation would be required.
- Tax exemptions would not change up-front costs, which are a greater obstacle to new development than taxes.

Adopt Tax Policies Which Discourage Holding Unimproved Property

Policy Issues for Arizona:

- It has never been politically popular to raise taxes.
- It would take a constitutional change to apply a differential tax rate. This may be difficult to achieve and opening the constitution to change would result in various interests exerting political force to lobby other changes that may be less desirable.

- Such a tax structure could result in the demolition of low income housing to reduce the tax penalty on the low value improvement.
- Conversely, high tax rates on land might bring land values down and result in more land for affordable housing. (Exemptions were developed to minimize this effect in Pittsburgh.)

Tax Increment Financing Programs

Policy Issues for Arizona:

- Arizona statutes do not provide the authority for TIF. Year after year, TIF bills have been introduced in the legislature and subsequently opposed by school districts, fire districts and other agencies that apply taxes within the district. This opposition is based on legitimate concerns that existing funding might be jeopardized. A package that carefully evaluates and mitigates the impact on these bodies would be necessary to make the authorization of TIF more palatable. Such comprehensive legislative change can be difficult.
- TIF is sometimes unpopular because of the potential for abuse. There have been cases in which private development is subsidized without public benefit. This could be avoided by incorporating protection that makes TIF available only for specific needs, such as affordable housing or some other high-priority community need into proposed legislation.
- TIF financing alone may not be enough to attract development. It should be considered as part of a strategy in an infill development policy and program.

Findings

The most effective infill policy is one that is consistently supported throughout other local government policies. Streamlining local policy to accommodate infill development may be the most effective strategy over which cities have purview.

All things being equal, marginal cost pricing of infrastructure might encourage some developers to select infill parcels over greenfields. Targeting specific areas for higher density, mixed-use infill development and, conversely, eliminating others from consideration for this development, consistent neighborhood, historic preservation and environmental policy are other elements that should be considered in infill programs. Cities are also in a position to facilitate a collaborative process of the different stakeholders in infill development.

Recommendations

1. Most communities have included the framework for infill and redevelopment in the Growing Smarter General Plan Updates. These should be followed up by implementation policies with specific timelines.
2. Mature cities and towns that are considering their infill policies should consider a comprehensive audit of zoning and subdivision ordinances and city processes for impacts on infill, redevelopment and transit oriented development potential.
3. Cities should continue to support marginal cost pricing of infrastructure. As noted in the best practices work on the adequate public facilities ordinances and development fees,

most communities do not provide streets, water, and wastewater facilities on the urban periphery from the city general fund.

4. MAG member agencies should work to develop a legislative package of recommended changes to state tax law to promote infill development. Tax measures that have successfully promoted infill development in other places include tax rates that discourage holding unimproved infill sites, the use of 10- year tax exemptions as an incentive, and the ability to establish tax increment financing districts.
5. Cities should develop design guidelines that reduce the impact of new development on existing neighborhoods. Building details, massing, proportions and materials of nearby quality buildings can be used to effectively "blend in" new development. When these are developed with the participation of key stakeholders, they can generate community support for infill development and reduce developer fears of potential project denial based on community rejection.
6. Cities should promote adequate densities for infill. The appropriate density will be different for each site. However, there is a certain density required to make a project financially feasible and to add enough people to the infill area to achieve the goals of a particular city or town. An infill overlay district can include density bonuses. These should consider standards that provide for subtle transitions between densities.

17. Transit Oriented Development

In interviews with planning department staff from MAG member agencies, several reasons were given for selecting Transit Oriented Development (TOD) as a topic for Best Practices Paper #6:

- Within six years, the first leg of a 20.3-mile, billion-dollar light rail, transit system will be completed. It is important to develop TOD policies now, so that inappropriate development does not preclude the opportunity to develop vital, mixed-use transit nodes. Although it is possible for development to incrementally occur at transit stops, strategic planning will increase the likelihood that this development will function well.
- A commitment to TOD means massing densities in these areas. A comprehensive policy to do this would also require lower densities in other areas. It is important to examine municipal policies and processes to ensure that they do not conflict with the potential for successful TODs.
- It is important to create the right mix of uses to make transit nodes truly functional. Understanding some of the components of a successful TOD is helpful. How can these be created?

Transit Oriented Development Defined

TOD has received much attention as part of the “smart growth”, “new urbanism”, and “livable neighborhoods” movements. “Smart growth” is generally seen as an alternative to “urban sprawl” with the goal of using resources more efficiently by reducing the amount of mobility required to access basic goods and services.

TOD, like “Smart Growth”, is an evolving concept. Peter Calthorpe defined the TOD concept as follows, “...moderate and high-density housing, along with complementary public uses, jobs, retail and services, are concentrated in mixed-use developments at strategic points along the regional transit system.” He also asserts that there are three principles necessary for TOD:

“...first, that the regional structure of growth should be guided by the expansion of transit and a more compact urban form; second, that our ubiquitous single-use zonings should be replaced with standards for mixed-used, walkable neighborhoods; and third, that our urban design policies should create an architecture oriented toward the public domain and human dimension rather than the private domain and the auto scale.” (Calthorpe 1993, pp. 41)

Defining transit-oriented development is challenging since many terms have been used to describe the basic idea of TOD, such as “transit villages,” “transit supportive development,” and “transit-friendly design.” According to the Victoria Transport Policy Institute:

“TOD refers to residential and commercial areas designed to maximize access by transit and non-motorized transportation, and with other features to encourage transit ridership. A TOD neighborhood has a center with a rail or bus station, surrounded by relatively high-density development, with progressively lower-density spreading outwards . . . TOD neighborhoods typically have a diameter of one-quarter to one-half mile (stations spaced half to one mile apart), which represents pedestrian scale distances (2002).”

Relevance of TOD to MAG Region

TOD concepts are especially relevant to cities interested in light rail transit (LRT). The current light rail plans for the region, as documented in MAG's 2002 Long Range Transportation Plan, include a 39-mile system. The first segment of the line, the Central Phoenix/East Valley Light Rail Transit Project, is currently entering final design stage and is scheduled to begin construction in 2003.

Twenty-seven station locations have been identified along the alignment, with 21 scheduled for completion by opening day and six scheduled for development by 2010. Stations are generally located about a mile apart, but closer (½ mile apart) in urban centers. Shuttle buses and an improved fixed route network play an important, supportive role in the light rail system.

In addition to the initial segment of the LRT system, other extensions are possible. MAG is currently creating a High Capacity Transit Plan (HCT), which will identify potential commuter rail, and light rail/bus rapid transit corridors in the region.

Benefits and Costs

Table 17-1 on the following page summarizes potential benefits of TOD.

There are also costs associated with TOD. Providing adequate levels of transit can cost a substantial amount of money. The MAG region is currently developing a higher capacity transit system starting with the initial segment of the Central Phoenix/East Valley Light Rail Transit System. Capital costs for creating light rail can range from \$40 to \$60 million a mile, and capital costs for creating a commuter rail system can range from \$2 to \$20 million per mile. Other costs associated with TOD include providing enhanced bicycle and pedestrian amenities.

There are some potentially negative impacts associated with higher density development, such as increased congestion, and exposure to noise and air pollution. Increasing density has been known to reduce the amount of green space within an urbanized area. While these costs can be mitigated through design, these additional features often have costs as well.

Table 17-1: Benefits of Transit Oriented Development

A recent study, *Factors for Success in California's Transit-Oriented Development*, commissioned by the California Department of Transportation, identified the following 10 potential benefits of TOD. The study cites research showing that TOD can:

1. **Provide mobility choices.** By creating “activity nodes” linked by transit, TOD provides important mobility options, very much needed in congested metropolitan areas. This also allows young people, the elderly, people who prefer not to drive, and those who don’t own cars the ability to get around.
2. **Increase public safety.** By creating active places that are busy through the day and evening and providing “eyes on the street,” TOD helps increase safety for pedestrians, transit-users, and many others.
3. **Increase transit ridership.** TOD improves the efficiency and effectiveness of transit service investments by increasing the use of transit near stations by 20 to 40 percent, and up to five percent overall at the regional level.
4. **Reduce rates of vehicle miles traveled (VMT).** Vehicle travel in California has increase faster than the state’s population for many years. TOD can lower annual household rates of driving 20 - 40 percent for those living, working, and/or shopping within transit station areas.
5. **Increase households’ disposable income.** Housing and transportation are the first and second largest household expenses, respectively. TOD can free-up disposable income by reducing the need for more than one car and reducing driving costs, saving \$3,000 to \$4,000 per year.
6. **Reduce air pollution and energy consumption rates.** By providing safe and easy pedestrian access to transit, TOD allows households to lower rater of air pollution and energy consumption. Also, TODs can help households reduce rates of greenhouse gas emissions by 2.5 to 3.7 tons per year.
7. **Conserve resource lands and open space.** Because TOD consumes less land than low-density, auto-oriented growth, it reduces the need to convert farmland and open spaces to development.
8. **Play a role in economic development.** TOD is increasingly used as a tool to revitalize aging downtowns and declining urban neighborhoods, and to enhance tax revenues for local jurisdictions.
9. **Contribute to more affordable housing.** TOD can add to the supply of affordable housing. It was recently estimated that housing costs for land and structures can be significantly reduced through more compact growth patterns.
10. **Decrease local infrastructure costs.** TOD can reduce the costs for water, sewage, and road to local governments and property owners by up to 25 percent.

Source: Research Results Digest Number 52, Transit-Oriented Development and Joint Development in the United States: A Literature Review. Page 28. October 2002.

Urban Design Elements

Urban design elements provide the basis of TOD. According to the Victoria Transport Policy Institute, “best practices for TOD include:

- integrate transit and land use planning;
- provide high quality pedestrian and cycling facilities based on universal design;
- manage parking to minimize the amount of land devoted to car parks around stations;
- encourage carsharing to reduce the need to own automobiles;
- create complete communities, with shops, schools and other services within convenient walking distances within the TOD neighborhoods; and
- structure property taxes, development fees and utility rates to reflect the lower public service costs of clustered, infill development (2002)”.

The California Department of Transportation sponsored *Statewide Transit-Oriented Development Study* includes a helpful TOD Evaluation Checklist for use by local jurisdictions, transit agencies and developers in evaluating whether a project or plan conforms to TOD criteria.

The TOD evaluation checklist is presented as Table 17-2. Urban design elements that are important in TOD are discussed in more detail below.

Integrate Transit and Land Use Planning; Mixture of Land Uses

Although the concept of integrating transit and land use planning is not new to urban designers and planning professionals, it has been difficult to institutionalize the integration of the two disciplines in most areas of the country

Perhaps the most important design elements of TOD are density and mixture of land uses. Density must be sufficient to support the investment of transit, and the mixture of land uses should have people in proximity to the daily services they need.

The appropriate mix of land of land uses, and their relative size, are somewhat subjective and need to respond to “neighborhood objectives, market realities and existing development patterns” (TCRP 2002, 82). Peter Calthorpe (1993) suggested that at a minimum, a commercial core area should comprise 10 percent of a TOD site with at least 10,000 square feet of retail space adjacent to the transit stop.” All commercial core areas should provide convenience shopping for TOD residents and employees and nearby “secondary area” residents and employees.

Table 17-2: TOD Evaluation Checklist

A recent study, *Factors for Success in California's Transit-Oriented Development*, commissioned by the California Department of Transportation, provides a checklist for use by local communities, transit agencies and developers to determine if a project or plan conforms to TOD criteria.

Within an easy walk of a major transit stop ($\frac{1}{4}$ to $\frac{1}{2}$ mile), consider the following:

Land Use

- ☐ Are key sites designated for “transit-friendly” uses and densities? (walkable, mixed-use, not dominated by activities with significant automobile use)
- ☐ Are “transit-friendly” land uses permitted outright, not requiring special approval?
- ☐ Are higher densities allowed near transit?
- ☐ Are multiple compatible uses permitted within buildings near transit?
- ☐ Is a mix of uses generating pedestrian traffic concentrated within walking distance of transit?
- ☐ Are auto-oriented uses discouraged or prohibited near transit?

Site Design

- ☐ Are buildings and primary entrances sited to be easily accessible from the street?
- ☐ Do the designs of areas and buildings allow direct pedestrian movements between transit, mixed land uses, and surrounding areas?
- ☐ Does the site's design allow for the intensification of densities over time?
- ☐ Are the first floor uses “active” and pedestrian oriented?
- ☐ Are amenities provided to help create a pedestrian environment along and between buildings?
- ☐ Are there sidewalks along the site frontage? Do they connect to sidewalks and streets on adjacent and nearby properties?
- ☐ Are there trees sheltering streets and sidewalks? Pedestrian-scale lighting?

Street Patterns and Parking

- ☐ Are parking requirements reduced in close proximity to transit, compared to the norm?
- ☐ Is structured parking encouraged rather than surface lots in higher-density areas?
- ☐ Is most of the parking located to the side or to the rear of the buildings?
- ☐ Are street patterns based on a grid/interconnected system that simplifies access?
- ☐ Are pedestrian routes buffered from fast-moving traffic and expanses of parking?
- ☐ Are there convenient crosswalks to other uses on-and off-site?
- ☐ Can residents and employees safely walk or bicycle to a store, post office, park, café or bank?
- ☐ Does the site's street pattern connect with streets in adjacent developments?

Source: California Department of Transportation. Statewide Transit-Oriented Development Study. Final Report. September, 2002. Pages 20 and 21.

Density around transit stations helps to “shorten trips by bringing activities closer together; encouraging more non-motorized (walk and bike) travel; increase vehicle occupancy levels of motorized trips by encouraged transit usage and ride-sharing (TCRP 2002, pp. 80)”. These three factors most influence Vehicle Miles Traveled, or VMT, and help to shift VMT to modes other than the single occupant vehicle

Does the MAG Region Have Sufficient Density to Support Transit?

Transportation professionals have heard from citizens and other planning professionals that the MAG region does not have sufficient density to support transit service. In the early stages of planning work for the MAG High Capacity Transit Plan, the consultant conducted a peer review of transit systems in North America with successful light rail, bus rapid transit and commuter rail transit systems. A general review of six transit systems for each transit mode was done, with three of these systems being analyzed in more detail.

The following minimum values were observed in the corridors studied for each of the three transit technologies, as shown in the table below:

	Commuter Rail	Light Rail	Bus Rapid Transit
Population Density (persons per square mile)	3,000	3,000	3,000
Employment Density (persons per square mile)	1,000	2,500	2,000
Average Trip Length (miles)	25	5	7
Daily Vehicle Trips on Parallel Corridors (per day)	100,000	75,000	41,000

The data collected from the peer systems was compared with future population and employment characteristics of potential transit corridors in the MAG region. Overall, the future scenario included a population of approximately 6.39 million – an approximate doubling of the 2001 regional population of 3.17 million.

The analysis showed that all of the corridors identified had the ability to support transit when compared with population thresholds created by the detailed data review of peer transit systems. While the ability to implement a comprehensive light rail/bus rapid transit and commuter rail system remains dependent on the decisions of public policy makers and funding constraints, the analysis done as part of the High Capacity Transit Plan shows that the MAG region will indeed have sufficient population density in the corridors identified to support high capacity transit service.

Pedestrian and Bicycling Facilities

Pedestrian and bicycling facilities that encourage walking and bicycling are an important urban design element of TOD, since all transit trips include some element of either walking or bicycling. Ideally, the pedestrian and bicycle networks near TODs link with an overall regional system of pathways so that transit can assist bicyclists and pedestrians in expanding their travel networks. Principles for achieving pedestrian-friendly designs in TODs are summarized in Table 17-3.

Table 17-3: Pedestrian-Friendly Design Principles

Create *pedestrian friendly streets* that will primarily serve foot traffic and encourage bicycle travel (Puget Sound Regional Council 1999).

Orient buildings to the street with set backs of no more than 25 feet (Ewing 1999A). Buildings placed close to a street minimize walking distances between destinations and also provides visual enclosure, an important element in creating a comfortable outdoor environment. Though there is some disagreement between urban designers, Ewing (1997) suggests a ratio of building height to right-of-way and set-back width of 1:3. This translates to 20-foot high store fronts on 60-foot wide lots.

Set minimum floor-area ratios (FARs) for retail and commercial uses to create a lively streetscape and minimize dead spaces created by parking lots. Calthorpe (1993) suggests a minimum FAR of 0.35, while the Puget Sound Regional Council (1999) suggests a target of 0.5 to 1.0 for developments without structured parking and at least 2.0 for developments with structured parking.

Use ***grid-like street patterns*** that allow many origins and destinations to be connected by foot; avoid cul-de-sacs, serpentine streets, and other curvilinear alignments that create circuitous walks and force buses to meander or retrace their paths (Bernick and Cervero 1997).

Use ***traffic-calming measures*** such as narrow streets, on-street parking, vertical realignments (e.g., street tables), horizontal realignments (e.g., chicanes), and street trees (Ewing 1999A; Puget Sound Regional Council 1999). Ewing (1999A) contends that street trees spaced 30 feet apart provide an added benefit of creating visual enclosure.

Shorten trips through good site planning, using short blocks and straight streets, minimal building setbacks, and pedestrian shortcuts. To encourage walking, block lengths of 300 feet are suggested since smaller block faces allow for high levels of pedestrian connectivity (Ewing 1997).

Provide a ***continuous network of sidewalks wide enough to accommodate anticipated levels of pedestrian traffic*** (Ewing, 1997). Sidewalks should be located along or visible from all streets and allow comfortable, direct access to core commercial areas and transit stops (Puget Sound Regional Council 1999).

Ensure ***safe, convenient, and frequent street crossings***. Signalized crossings, bulb-outs, and mid-block crossings are recommended (Puget Sound Regional Council 1997). Ewing (199A) notes that smaller corner radii shorten crossing distances, induce motorists to slow down at corners, and discourage rolling stops. Bus drivers, however, counter that tight turning geometries hamper bus movements.

Use landscaping, weather protection, public art, street furniture, lighting, public phones, and other provisions in public spaces. Likewise, require all developments to provide for pedestrian and cyclist needs, such as benches, continuous awnings, bicycle racks and street trees (Puget Sound Regional Council 1999).

Source: Research Results Digest Number 52, Transit-Oriented Development and Joint Development in the United States: A Literature Review. Pages 84 - 86. October 2002.

Parking

Many jurisdictions will use some type of parking management strategy in TODs to make efficient use of parking resources, and to encourage people to use transit services.¹ Table 17-4 summarizes parking management strategies. It should be noted that, especially in developing rail systems, such as the Central Phoenix/East Valley Light Rail Transit System, extensive parking is typically provided at transit stops to help maximize transit ridership.

A common approach is to use park-and-ride lots for commuters as a way to preserve land for future development. The idea is that parking lots can be converted to infill sites if local land use policies and market conditions are supportive of such a change.

Prominent Public Spaces

Integrating public spaces with TODs, and placing them as close to transit stops as possible can create more prominent open spaces. This element of TOD relies on the concepts of “new urbanism” which are traditional community design and town planning principles. Peter Calthorpe (1993) asserts that each TOD needs “village greens and transit plazas... to create a prominent civic component to core commercial areas.”

Successful Examples

Two of many examples of successful TOD projects and programs in western United States cities include.

King County Department of Transportation – Seattle, Washington

King County has been working on bus-related TOD projects since 1998, including projects in Renton and Seattle.

San Diego Metropolitan Transit Development Board

Local and regional agencies have adopted policies to encourage TOD plans at more than 15 light rail stations. The projects provide mixed-use development and are typically private-public partnerships.

¹ TDM is a commonly accepted acronym for Traffic Demand Management. It refers to using various techniques to manage the demand for roadway space.

Table 17-4: Parking Management Strategies and Travel Reductions

Parking Management Strategy	Description	Parking Demand Reduction
Shared Parking	Share parking facilities among a group of users rather than assigning each an individual space. Greater reductions are possible with mixed land uses, since different activities have different peak demand times.	15 - 40%
More Accurate Requirements	Reduce minimum parking requirements at sites with lower parking demand.	10 - 30%
Trade-off with TDM Strategies	Reduce parking requirements at facilities with TDM programs.	10 - 30%
Parking Pricing	Charge motorists for using parking facilities using cost recovery prices.	10 - 30%
Favor Short-term Use	Avoid discounts for long-term leases.	Varies
Cashing Out	Provide the cash equivalent of free parking to commuters who use alternative modes.	10 - 30%
Unbundle Parking	Rent and sell parking facilities separately, rather than automatically included with housing and commercial leases and purchases.	Varies
Location Efficient Development and Mortgages	Design and manage development at more accessible locations to encourage use of alternative modes.	20 - 50 %
Address Spillover Problems	Use management, pricing and enforcement strategies to address spillover problems.	Varies
Develop Overflow Parking Plans	Use overflow parking plans, rather than excessive supply, to address occasional events.	Varies
Regulate Use of Parking Facilities	Use regulations to encourage more efficient use of existing parking supply.	Varies
Parking Maximums	Limit maximum parking supply in an area.	Varies
In Lieu Fees	Use developer fees to fund public parking instead of requiring individual facilities to provide off-street parking.	Varies
Tax Parking	Impose taxes on parking facilities and their use.	Varies
Parking Facility Design	Design parking facilities to address various problems.	Varies

Source: Online TDM Encyclopedia – Parking Management. Victoria Transport Policy Institute. www.vtpi.org/tdm/tdm28.htm.
Updated November 5, 2002..

Implementation

TOD is typically implemented by local and regional governments with the assistance of private developers and businesses. A basic understanding of the challenges to creating successful TOD, and potential solutions, can provide guidance to MAG member agencies on implementing successful TOD projects. These are described below.

Challenges to Creating Transit Oriented Development

A recent publication of the Transit Cooperative Research Program (TCRP) explains that constraints to implementing TOD can be categorized as fiscal, organizational and political. Fiscal constraints are factors that might limit the financial feasibility of TOD projects, such as inaccurate or unrealistic market assessments, or inability to obtain financing. Organizational constraints are structural issues that prevent building partnership between transit agencies and other governmental agencies responsible for project implementation. Political constraints include inappropriate land use policies and neighborhood resistance to additional commercial development or density increases.

Fiscal Constraints

Many cities have had to obtain funding on their own because prior efforts to secure regional funding for transit service at the ballot box have not been successful in the MAG region. The cities of Glendale, Phoenix and Tempe have local sales taxes dedicated to the provision of transportation services.

In addition, the high cost of providing supporting infrastructure, such as bicycle and pedestrian facilities (sidewalks, bicycle lanes, shading and rest areas), expanded sewer and water capacity and signalization upgrades can pose implementation barriers as there is competition for dollars to implement projects. The relative “newness” of TOD concepts makes their economic viability questionable, which makes securing traditional loans to construct TOD projects challenging.

Organizational Constraints

Organizational constraints can arise if organizations responsible for transportation have different goals and policies, and different decision-making structures. “Struggles over turf and resistance to change within public agencies are legendary and present major obstacles to effective project implementation” (TCRP 2002, 73).

Political Constraints

Residents may perceive infill TOD projects that provide a mixture of land uses, such as additional housing and offices, as having negative impact on the community, including increased congestion, additional stress on crowded schools, and crowding at neighborhood stores. Neighborhood opposition has stopped many infill mixed-use developments throughout the country, in places such as Oakland, Miami, Atlanta and many other areas

Political issues can also become an issue between different transit user groups. For example, commuters from outlying suburban areas typically want extensive parking surrounding rail stations, which discourages nearby high-density development and walk-access to transit.

Overcoming the Implementation Barriers

While there are a number of implementation barriers, collaboration is key to successful systems. There are many partners to include in creating a successful TOD, including developers, financial lending institutions, cities and towns, regional planning agencies, transit agencies and public interest groups. The formation of public-private partnerships has been a key component of success in many TOD projects.

Fiscal Constraints

Unfortunately, there is no easy solution to the financial obstacles of providing adequate transit service and supporting infrastructure to create TODs

There are a number of financial incentives that can be made available by government and public institutions, such as:

- grants
- sliding-scale impact fees
- tax abatement
- creative financing
- direct public-sector
- financial participation
- benefit assessment districts
- enterprise zones
- tax increment financing (not available in Arizona)
- loans

While financial institutions have a role to play in providing new and alternative funding options, the public sector can play a role in overcoming some of the financial barriers that make TODs more costly as well. For example, local government agencies can assist with site assembly, low-cost financing through tax-exempt financing, loan guarantees or federal grants, expediting the permitting process, and by providing infrastructure.

Tax relief is one method of enticing developers to locate near transit stations. The problem for Arizona is that our State enabling legislation does not allow that. Mixing funding sources by using both private and federal grants is a way to spread financial risk and increase the ability of a private lender to obtain funding. Local governments also have the option of providing supporting infrastructure, such as bicycle and pedestrian facilities (sidewalks, bicycle lanes, shading and rest areas), expanded sewer and water capacity, and signalization upgrades.

While some transit operating agencies have chosen to proactively influence land markets surrounding transit stations, others have chosen to facilitate and coordinate TOD between interested parties. Regardless of the level of advocacy, areas with successful TOD projects recognize that creating markets to fill buses and trains helps to maximize public investment in transit

Organizational Constraints

The best way to overcome organizational constraints is through collaboration. When different organizations have different decision-making structures and different organizational goals and objectives, the people involved in the TOD process must work together to find shared goals that work for all partners involved.

Political Constraints

Community outreach is an essential component of any TOD project to help identify and resolve political issues. Neighborhoods must be convinced that a TOD project will positively impact their community. Regional and local levels of government, as well as transit agencies, need to be involved in a public education and outreach program using a variety of public involvement techniques, such as community meetings, public workshops and media communication. Obtaining and responding to public input helps build trust.

Zoning and other development policies and regulations, overseen by local governments, influence the type and character of most development, including the development surrounding transit stations. There are a number of regulations, such as zoning, planned unit development classifications, specific-plan initiatives, and transfer of development rights programs that have been used successfully in other areas of the county.

Resources for MAG Member Agencies

Although the term “transit oriented development” may be new to the MAG region, several of the underlying concepts, especially in the area of encouraging pedestrian use, are not new. The MAG region has already developed several resources to assist member agencies in determining the appropriateness of TOD, and its underlying concepts, for different locations in the Region.

MAG Pedestrian Area Policies and Design Guidelines

Past pedestrian planning efforts conducted by MAG, with the support of its member agencies, have led to a variety of pedestrian-oriented policies, programs and roadway improvements. Prominent among these are the *1993 Pedestrian Plan*, the creation of the MAG Pedestrian Working Group, a region-wide household travel survey, the publication of the *1995 Pedestrian Area Policies and Design Guidelines*, the Walking and Bicycling into the 21st Century Conference Series, and the Pedestrian Design Assistance Program.

The MAG Pedestrian Working Group created the *Pedestrian Area Policies and Design Guidelines* in 1995. The *Guidelines* identify types of pedestrian areas commonly found in the MAG region, and proposes policies and design elements to promote walking. The *Guidelines* provide a basic understanding of pedestrian needs and recommendations for overall changes to better accommodate pedestrians in the MAG region.

The MAG *Pedestrian Area Policies and Design Guidelines* is a comprehensive manual of pedestrian policies and facility design that creates a regional standard for use by community groups, planners and design professionals alike. The book won the Arizona Planning Association’s best ordinance award in 1996 and is requested by planners nationwide.

Valley Metro Pedestrian-oriented Design (PeD) Standards and Design Guidelines

Valley Metro’s *PeD Guidelines* were established to “ . . . assist elected and appointed planning officials, members of planning and zoning boards, technical planning staff, transit agency staff, community representatives, developers, property owners, architects and interested citizens who wish to improve the condition of the pedestrian realm and promote walking as a viable transportation alternative in the Valley Region.

Providing evidence of locally supportive policies to transit investments is a step in securing funding from the federal government for light rail transit investments.

Basic elements of *PeD* include a link between transportation and land use decision-making; compact, mixed use development; reduced parking; and a fine-grained interconnected street system. The *PeD Guidelines* include a thorough explanation of different types of street systems, and include guidelines and standards on land use types and intensity; creating and maintaining community and neighborhood identity; circulation systems; public open spaces and parks, and details on site designs.

Light Rail Transit; Phoenix, Arizona – Economic Development along the Planned Light-Rail Line

This report, completed in December 2001 by the Urban Land Institute (ULI) and sponsored by the City of Phoenix and ULI Arizona, evaluated potential land uses around four stations along the Central Phoenix/East Valley Light Rail Transit Project line. The professional experts of the panel examined four main issues: market potential; planning and design; development strategies; and implementation.

The report includes several other specific recommendations and policies to help improve the effectiveness of the initial segment of the LRT system support economic development. The report is available on the LRT Project Web site at www.valleyconnections.com.

City of Phoenix Transit Overlay District

The first step in planning for transit-oriented development was the inclusion of a transit-oriented development goal within the Phoenix General Plan. That goal was adopted by City Council in November 2001 and ratified by the voters in March 2002.

The next step in the process is to approve a text amendment to zoning ordinance (TA-23-00) that contains regulations for the lands approximately one-quarter mile to 2000-feet adjacent to proposed light rail stations, which is approximately the distance a pedestrian can walk in five to ten minutes. This new zoning district will be known as the Transit Oriented-Development Interim Overlay Zoning District (TOD). This district will ONLY apply to new development and construction. The district will prohibit or limit the development of new uses that do not support transit ridership, that is, uses that transit riders do not use. Any existing uses that would be prohibited will be deemed non-conforming uses and allowed to remain in place.

The overlay district will also require additional development standards for any new construction including building frontage, facade and entry regulations, as well as sidewalk, parking and loading regulations.

Part V Regional Evaluation

18. Evaluation Plan

The Evaluation Plan is critical to deriving maximum benefit from the Regional Growing Smarter Implementation Project and regional planning efforts as a whole. Maricopa Association of Governments will be responsible for conducting ongoing evaluations.

The Maricopa Association of Governments' Regional Annual Report will serve as the evaluation plan for the Regional Growing Smarter Implementation Project. MAG Regional Council has approved a draft table of contents, and both staff and consultants are in the earliest stage of data collection. It is anticipated that the first annual report, measuring calendar year 2003, will be released about June 2004.

Performance Measures

Selected benchmarks will be used to measure performance of the region against historical conditions and those of other regions. Performance will be measured in seven broad areas that describe regional sustainability. In each of these, there are benchmark measures for comparison to other regions, as well as measures for metro Phoenix itself. The broad areas include:

1. **Growth** – indicators of the sheer amount of growth, including population, economy, and buildings.
2. **Urban Form** – indicators of the spatial development of growth.
3. **Quality Economy** – indicators of quality industries and the educational/workforce foundation needed to grow them.
4. **Transportation and Other Regional Infrastructure** – indicators of the efficiency of regional multi-modal transportation systems, of water consumption, of water/sewer line extensions, and of wastewater treatment.
5. **Housing** – indicators of housing prices and affordability.
6. **Environment** – indicators of air quality.
7. **Social, Civic and Cultural Well-Being** – indicators of quality of life for people.

Competing metropolitan regions that will be used for comparison purposes in evaluating regional performance:

- Atlanta
- Austin
- Denver
- Houston
- Portland

- Sacramento
- San Diego
- San Jose
- Seattle

The specific indicators or measures being considered are listed below. Each of the seven broad categories contain indicators that would be compared to other metropolitan regions, and indicators that would be presented for metro Phoenix as either time series, tables, or maps.

1. Growth

- Regional Comparison – Metro Phoenix and Other Metro Regions
 - Population growth - % change, amount
 - Gross Regional Product
 - Total employment growth - % change, amount
 - Increase in primary and secondary school enrollment
 - Building permits
- Time Series or Tables and Maps within Metro Phoenix
 - Natural increase
 - Net migration by type (economic, international, retirement)
 - Total population - % change, amount
 - Population in Pinal and Maricopa counties and their cities and towns
 - Gross Regional Product (region, Maricopa, Pinal) – time series
 - Total employment growth - % change, amount
 - Total employment by county, cities and towns in Maricopa and part of Pinal counties.
 - School enrollment by districts - % change and amount
 - New schools by districts: type of school, capacity, estimated opening enrollment.
 - Number of dwelling units permitted and square footage added

2. Urban Form

- Metropolitan Phoenix – Time Series or Tables and Maps within Metro Phoenix
 - Regional composite of municipal general plans – interpretive maps for build-out population and jobs
 - Major amendments to general plans of municipalities
 - State Trust Lands' conceptual plan areas in Maricopa and Pinal Counties
 - Annexed acres by cities and towns in Maricopa County and Pinal County
 - Regionally significant development projects by MAG member agency
 - Developments provided with new transportation, water and sewer infrastructure
 - Subdivision activity in Maricopa County for cities and towns and counties: total acres, number of lots, average density.
 - Industrial, business and research parks – existing and newly developed
 - Infill development by number and dwelling type, acres of commercial & employment for cities & towns
 - Growth of job centers

- Jobs/housing balance
- Vacancy rates for office, retail and industrial space
- Vacant space available – office, retail and industrial
- Number of acres sold by the State Land Department for development purposes.
- Number of acres bought by cities, towns, counties and non-profits for open space and parks.

3. Quality Economy

- Regional Comparison – Metro Phoenix and Other Metro Regions
 - Unemployment - % change, amount
 - Number of jobs added by high wage sectors
 - Average salary trends
 - Real per capita personal income
 - Cost of living - % change, amount
 - Educational attainment of persons over 25 years - census
 - Institutions of higher learning – number of institutions and enrollment
 - Community college enrollment
 - College degrees conferred
- Metropolitan Phoenix – Time Series or Tables and Maps within Metro Phoenix
 - Unemployment - % change, amount
 - Number of jobs added by high wage sectors and target industry clusters
 - Average salary trends
 - Real per capita personal income
 - Cost of living - % change, amount
 - Jobs by type in Maricopa County and portion of Pinal County cities and towns
 - Jobs by major occupational categories

4. Transportation and Other Regional Infrastructure

- Regional Comparison – Metro Phoenix and Other Metro Regions
 - Change in number of miles of highways
 - Roadway congestion index
 - Transit usage by numbers and change
 - Air passenger enplanements
- Metropolitan Phoenix – Time Series or Tables and Maps within Metro Phoenix
 - Regional Transportation Plan
 - Status of regional transportation improvements
 - Change in number of miles of highways constructed
 - Estimated vehicle miles traveled % change amount
 - Mass transit boardings and revenue-miles by modal type
 - Number of vehicle accidents - freeways
 - Number of vehicle accidents by cities, towns and unincorporated counties
 - Mass transit accidents
 - Miles of non-roadway trails added
 - Lane miles of bikeways added by cities, towns, counties and state

- Miles of major water and sewer line extensions by counties, cities and towns
- Available capacity of wastewater treatment plants
- New wastewater treatment plants added to the MAG Water Quality Management Plan

5. Housing

- Regional Comparison – Metro Phoenix and Other Metro Regions
 - Median housing sales price of new and existing homes - % change, amount
 - Housing opportunity index
 - Home ownership rates

6. Environment

- Regional Comparison – Metro Phoenix and Other Metro Regions
 - Air quality index

7. Social Well-Being

- Regional Comparison – Metro Phoenix and Other Metro Regions
 - Families in poverty - census
 - Children in poverty - census
 - Violent crimes - change, amount
 - Property crimes - change, amount
 - Population not covered by health insurance